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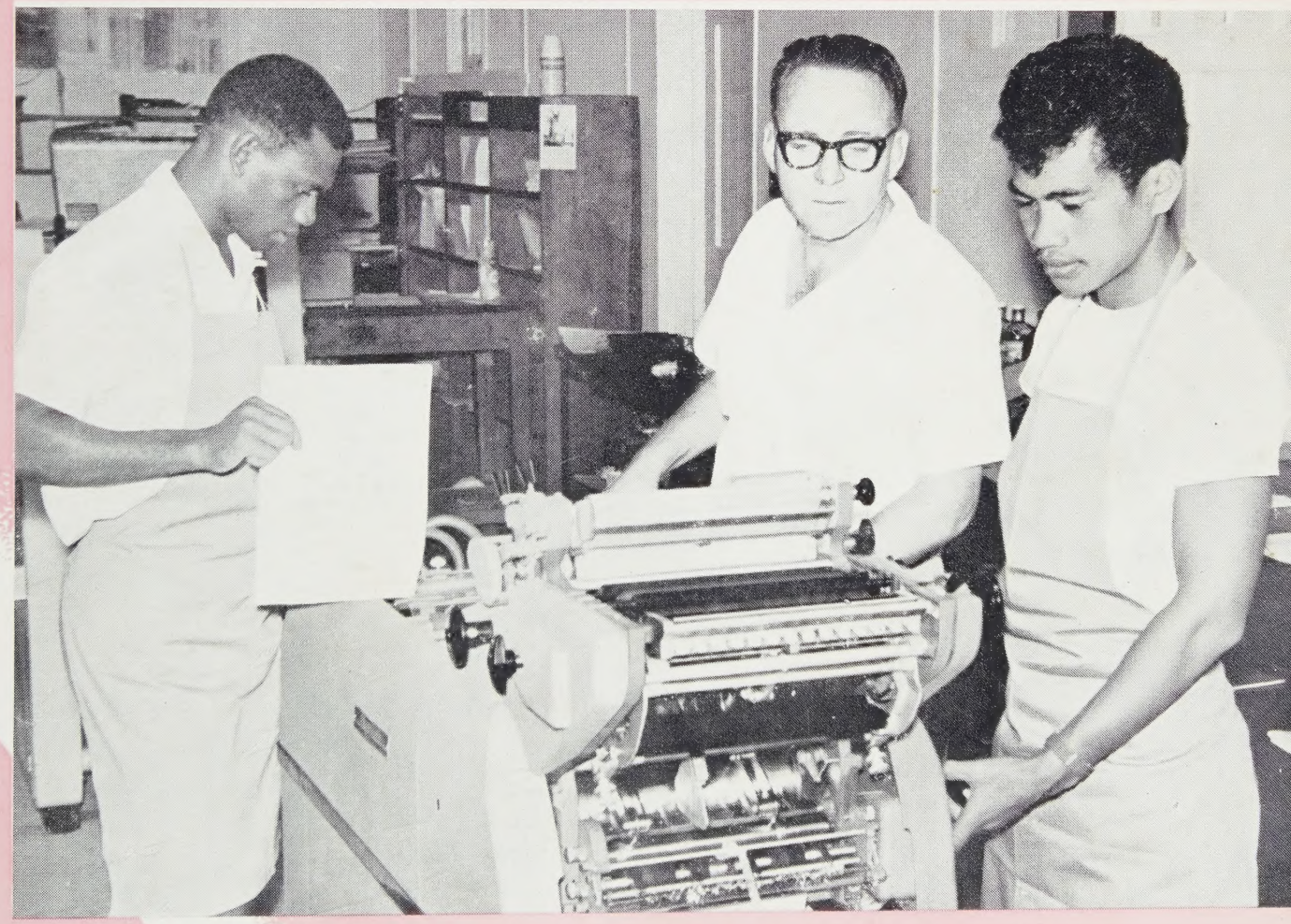

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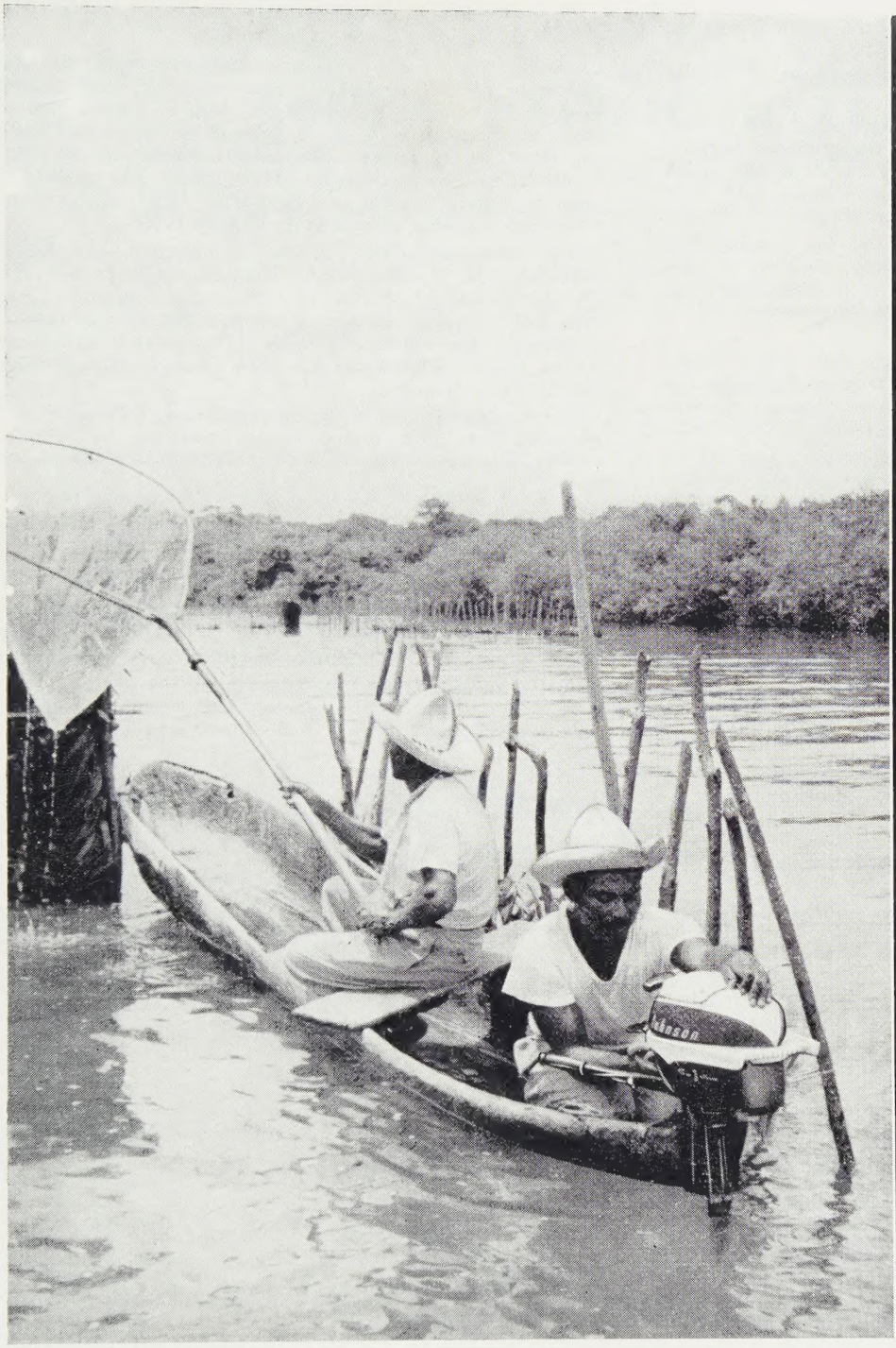

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The South Pacific Commission

The South Pacific Commission is an advisory and consultative body set up in 1947 by the six Governments responsible for the administration of island territories in the South Pacific region (Australia, France, the Netherlands, New Zealand, the United Kingdom and the United States of America).

The Commission's purpose is to advise the participating Governments on ways of improving the well-being of the people of the Pacific island territories. It is concerned with health, economic and social matters. Its headquarters are at Nouméa, New Caledonia.

The Commission consists of not more than twelve Commissioners, two from each Government. It normally holds one Session each year. There are two auxiliary bodies, the Research Council and the South Pacific Conference.

There is a Research Council meeting once a year. This may be either a meeting of the full Council, or of one or other of its three main sections, specializing in the fields of health, economic development and social development. Members of the Research Council are appointed by the Commission. They are selected for their special knowledge of the questions with which the Commission is concerned, and the problems of the territories in these fields. The chief function of the Research Council is to advise the Commission on what investigations are necessary. Arrangements to carry out those that are approved are the responsibility of the Secretary-General and other principal officers.

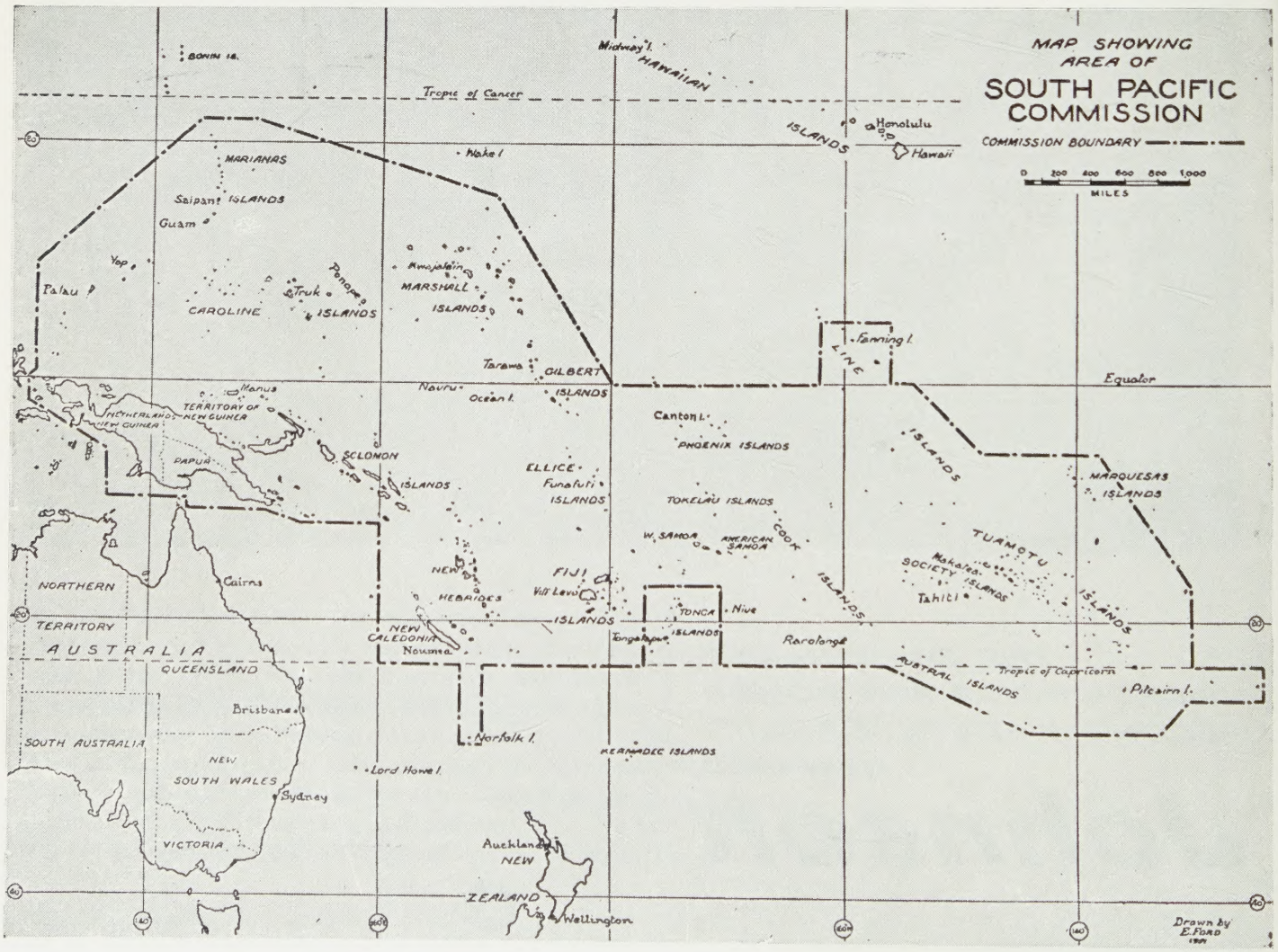
The South Pacific Conference, which meets at intervals not exceeding three years, consists of delegates from the local inhabitants of the territories, who may be accompanied by advisers. The first Conference was held in Fiji in April 1950, and was attended by delegates from fifteen territories and from the Kingdom of Tonga. The second Conference was held at Commission headquarters in April 1953. The third Conference was held in Fiji in April-May 1956, and the fourth Conference in New Britain in April-May 1959.

The principal officers of the Commission are: Secretary-General, Mr. T. R. Smith; Executive Officer for Health, Dr. T. K. Abbott; Executive Officer for Economic Development, Dr. Jacques Barrau; Executive Officer for Social Development, Dr. Richard Seddon. The powers and functions of the Deputy Chairman, Research Council, are exercised by the Secretary-General.

Further particulars of the Commission's activities may be obtained from the Secretary-General, Nouméa, New Caledonia.

FRONT COVER PHOTOGRAPH

Last February, twelve trainees from six Pacific territories arrived in Honiara, in the British Solomon Islands, to attend the first of three one-year courses being held at the Literature Production Training Centre recently set up there by the South Pacific Commission. In the cover photo Jon Koniel from Papua and New Guinea (left) and Teararoa Ariki from the Cook Islands (right) work on the printing machine with technical production officer A. M. Koenen. (See article on page 25.)



SOUTH PACIFIC BULLETIN

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EDITOR: *A. E. Read, B.Sc.*

THE SOUTH PACIFIC BULLETIN, first published in January, 1951, features articles on selected activities in the Commission's three main fields of operation: economic development, health and social development. Articles are also contributed by specialists working in these and related fields, in the territories within the Commission area.

THE BULLETIN is given selective world distribution to people and institutions in widely differing fields sharing a common interest in the purposes and work of the Commission. It is published in two editions, English and French.

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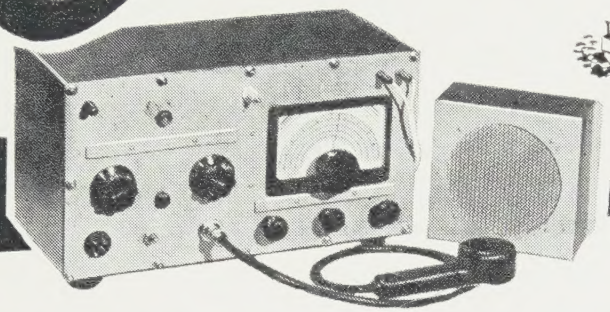

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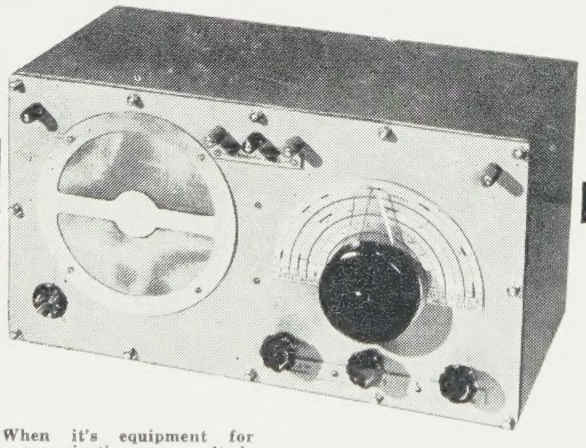

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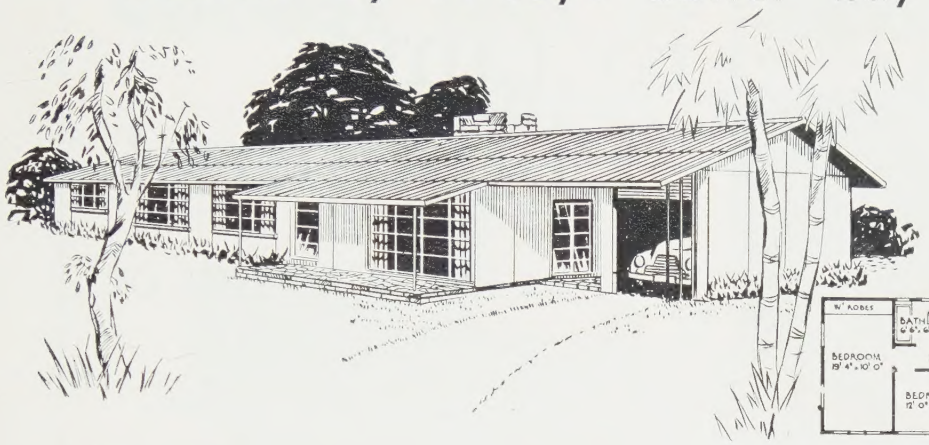

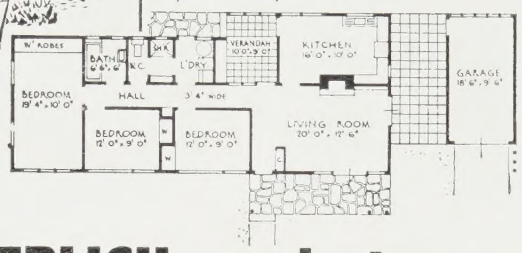

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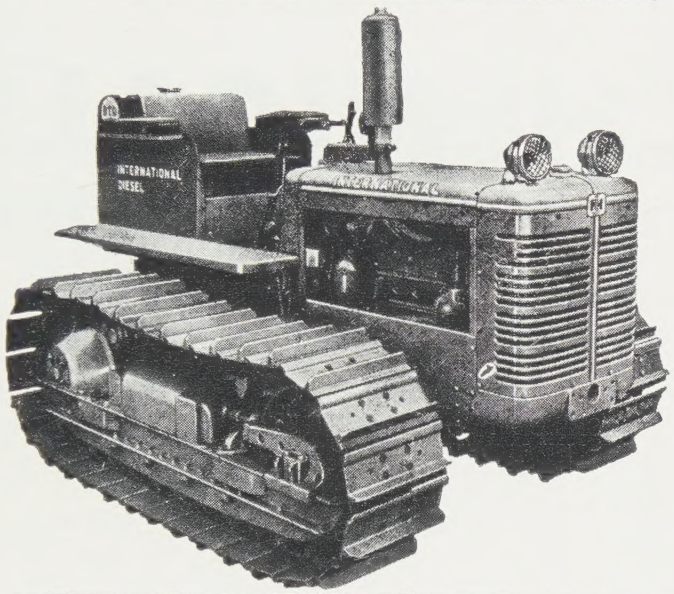

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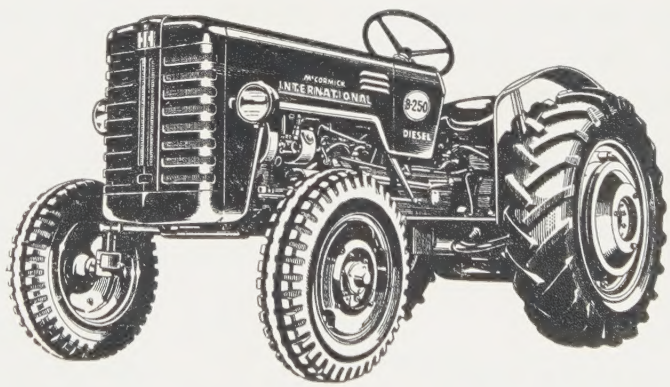

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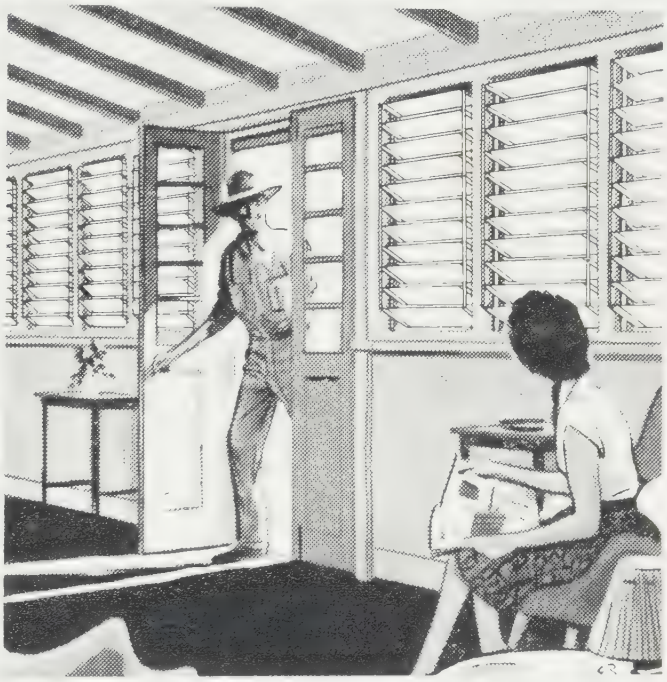

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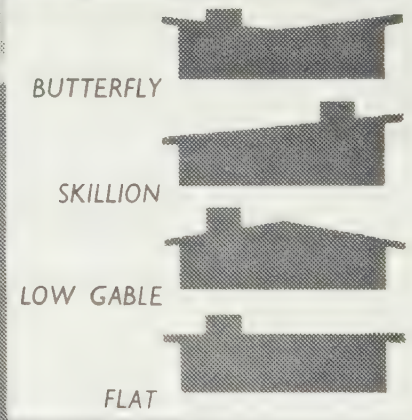

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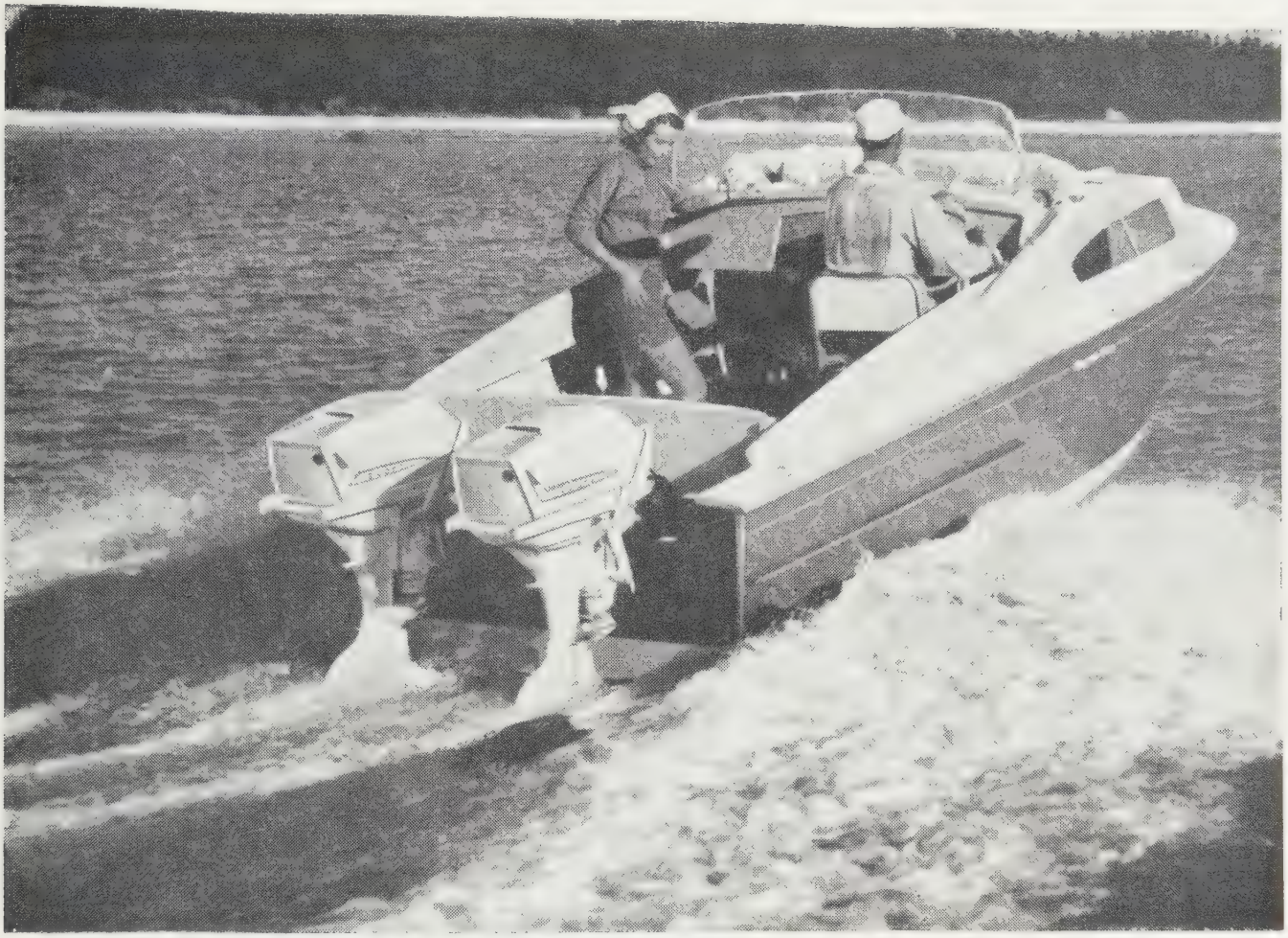

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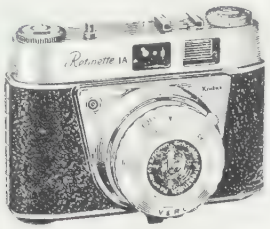

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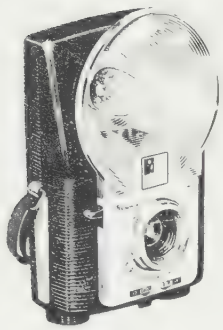

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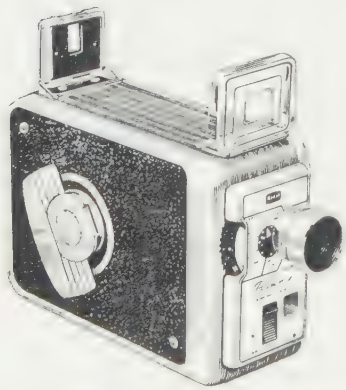

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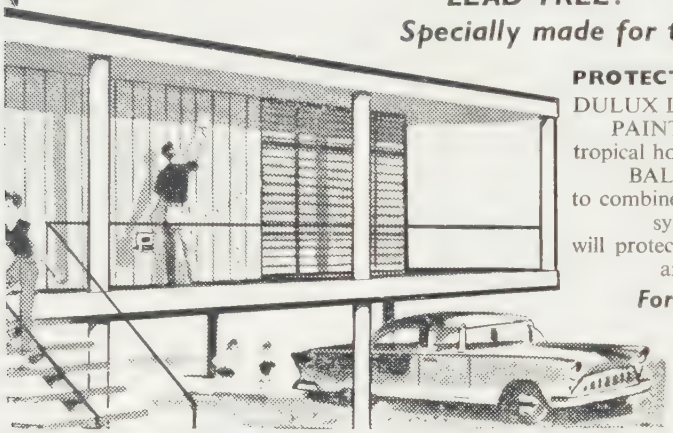

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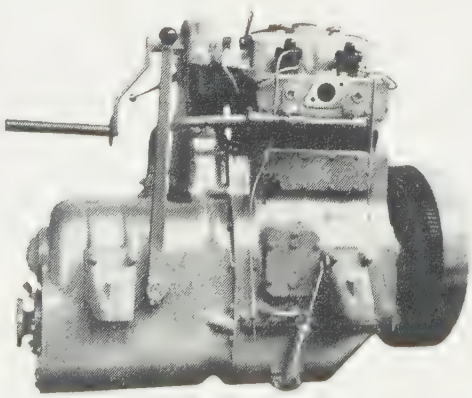

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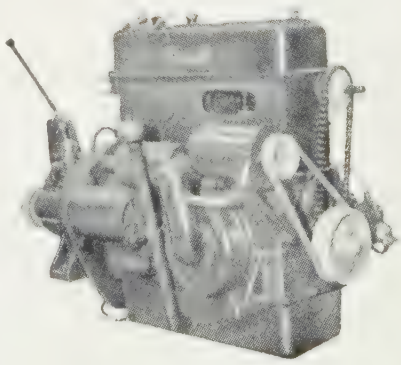

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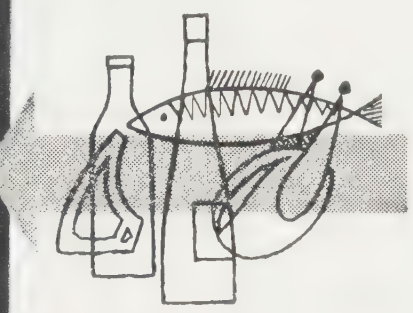

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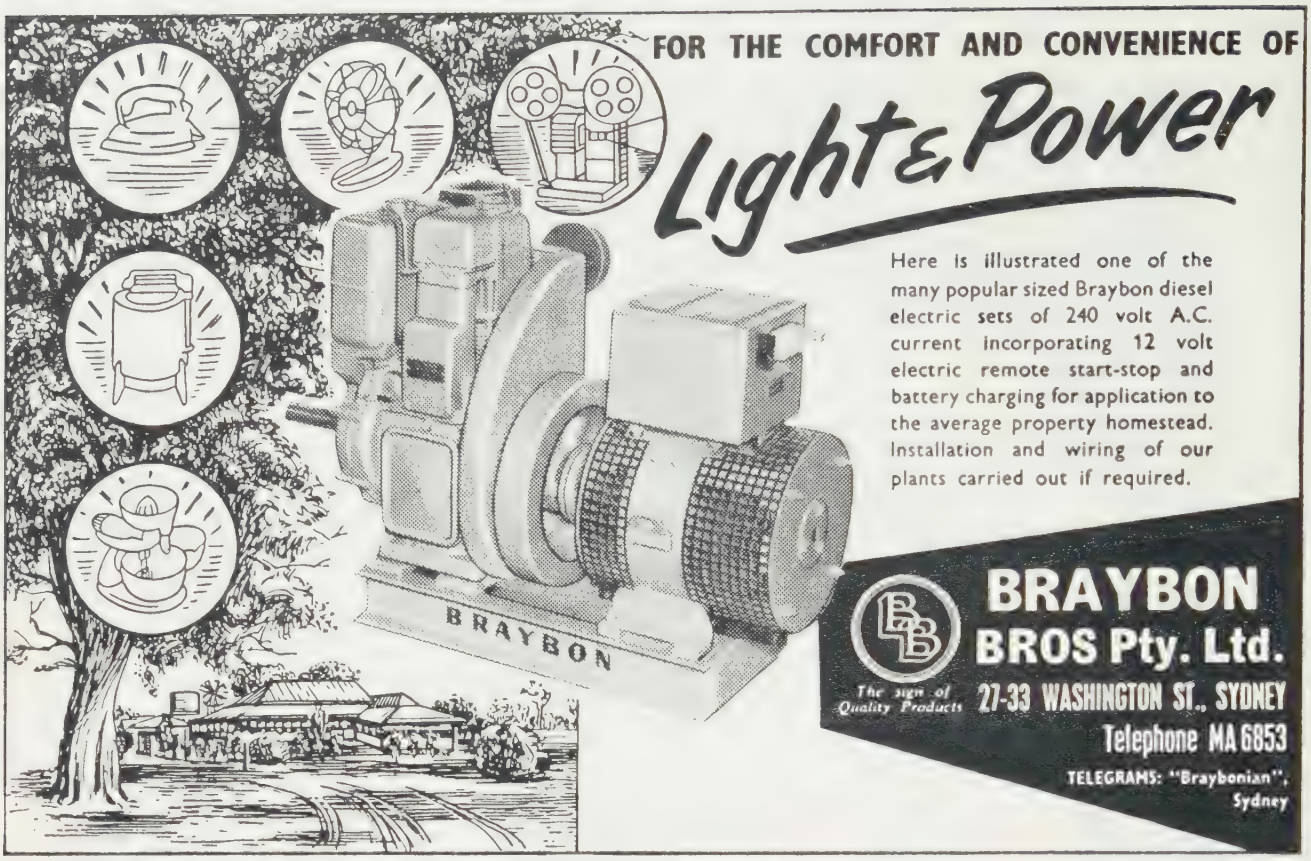
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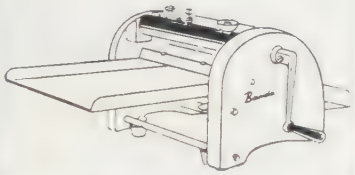

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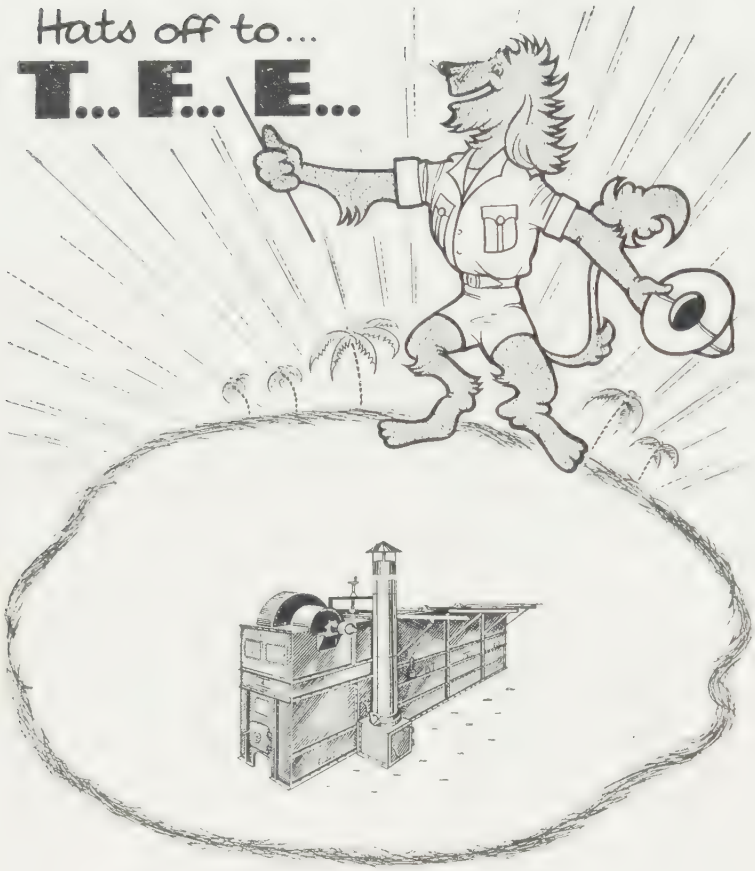

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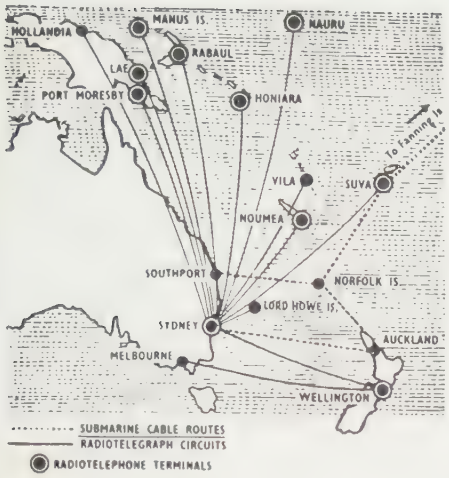

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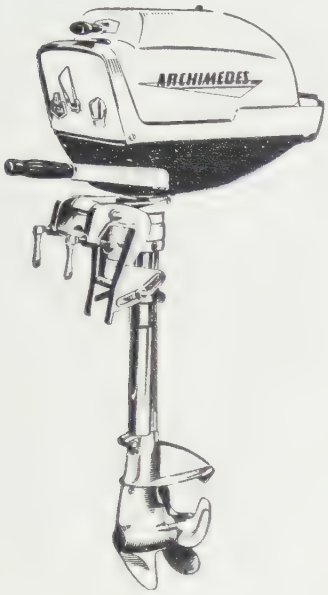

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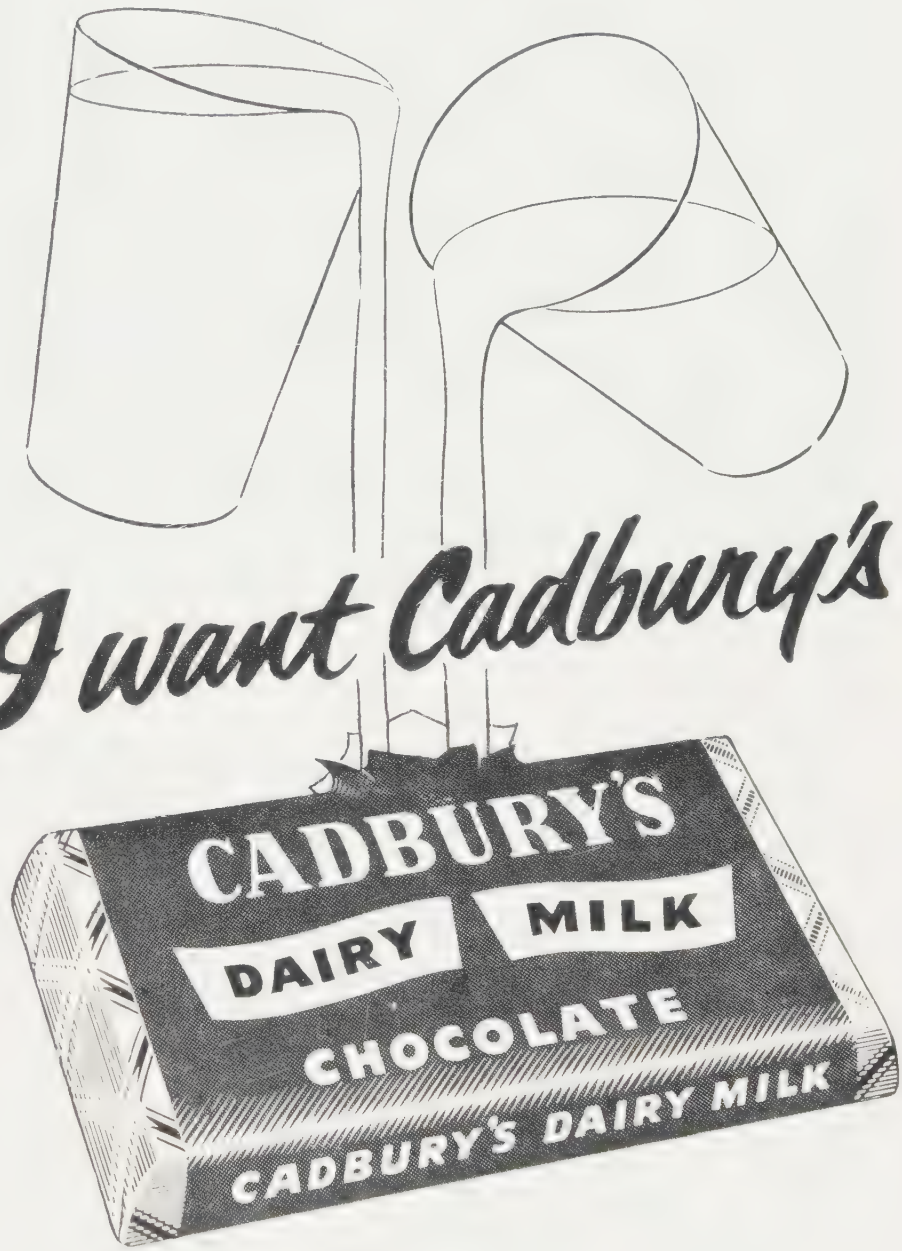

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Exterior views of a smallholder's copra kiln. This Ceylon type copra drier is being exhibited by the Department of Agriculture in the Solomon Islands as an alternative to its popular Kukum drier. The latter uses a sealed flue made from petrol drums, which are fast becoming unprocurable in the Solomons.

The Copra Industry In The Solomons

The high prices realized for copra in the past few years have stimulated coconut plantings in the British Solomon Islands Protectorate. However, the difficulties of transporting copra to export centres still constitute a retarding factor in the development of the industry there, according to the author of this survey. He congratulates the Department of Agriculture on its copra grading scheme, which over a period of years has greatly improved the overall quality of copra exported from the territory.

By D. R. A. EDEN

LYING between five and fourteen degrees south of the Equator, the British Solomon Islands Protectorate comprises literally thousands of islands, large and small. They follow a fairly distinct continental shelf line, and run in broken groups for nearly 500 miles from east to west.

One of the largest of these—and possibly the best known because of intense fighting there during the war—is Guadalcanal. It is roughly 100 miles long, and contains a central range whose highest peak rises nearly 8,000 feet above sea level. On its northern shore lies Honiara township, the post-war centre of government for the Western Pacific High Commission.

Honiara is built among great ridges of coralline limestone which undulate for miles along the coast of Guadalcanal. These ridges are ancient coral reefs, thrust up in pre-historic times from the ocean bed.

Birthplace Of Cyclones

The locality has an evil reputation for brewing hurricanes—I believe it was the Americans who first christened it "Hell's Kitchen".

Two views of the kiln illustrated above, under construction. Made largely from local materials, this kiln will process 1200 nuts into first-grade copra in two days.

Guadalcanal forms, together with its nearby islands of Savo, Florida and Malaita, a roughly circular but broken chain of land masses. Over these, storms gather, each separately charged with varying barometric pressures. A sequence of these low-pressure areas above the rounded chain of islands rotates the wind and forms a cyclone.

Fortunately for the Solomons, the rotating winds rush off at tangents from their starting base, gathering momentum as they go, perhaps to lash the islands of the Hebrides or those of Fiji, or to change course and wreak destruction upon the Queensland coast.

Many of the islands of the Protectorate possess rich volcanic soils, and with a climate which may be compared with the interior of an over-humid glasshouse, offer rich rewards to European and to indigenous farmers.

Around all the Solomon Islands coasts the coconut thrives, while further inland the valleys and lower slopes give promise of cocoa growing as a secondary industry.

Above: War-damaged palms are a common sight in the Solomons. This stem has been riddled with machine-gun bullets. Right: Some post-war planters in the Solomons obtained capital to purchase their plantations by the sale of scrap metal salvaged from Japanese wrecks such as this.

Pre- And Post-War Exports Of Copra

Over twenty thousand tons of copra were exported annually from the Solomons in pre-war years, and while in those days the bulk was produced from the European-owned estates, native production had commenced an upward trend.

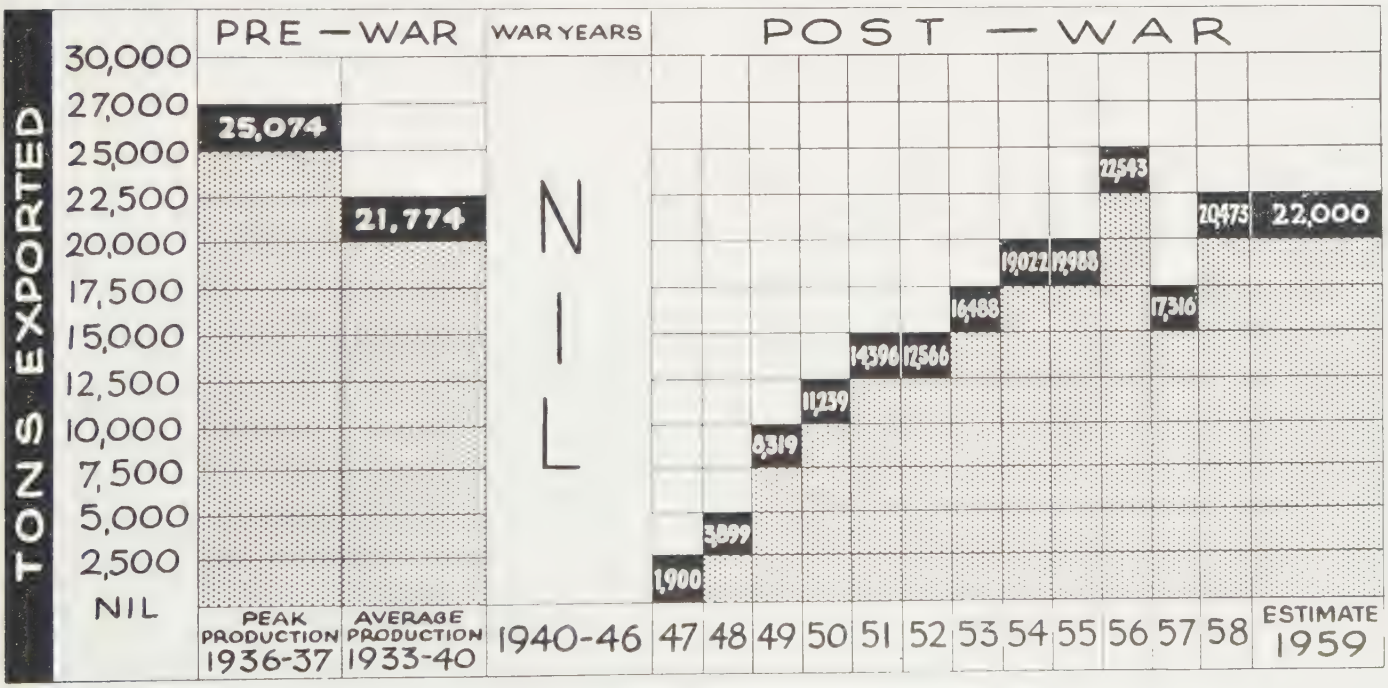
The war came and all production ceased. The well-cared-for coconut plantations were abandoned, and before hostilities ended the jungle moved in and obliterated their culture.

When fighting ended, some of the previous owners returned to re-carve their plantations from the secondary bush. Others had died, and their families sold their interests to newcomers. Scrap-hunters were fortunate, and high prices ruled for ferrous and non-ferrous junk left behind in the form of wrecked vessels and abandoned war equipment. Some made fortunes and left, while others invested in plantations in the territory which had provided them with capital.

Few of the new settlers knew much about planting at first, and for a time their lack of "know-how" held back the proper rehabilitation of the war-abandoned plantations. Others engaged experienced Solomon Islanders to run the estates on share-cropping arrangements which usually gave the contractor 50% of the gross income derived from the sale of the plantation's copra.

While such arrangements ensured maximum harvesting from the old areas, any serious development was retarded. For many years there was little replanting in war-damaged areas, while the planting of virgin land has only lately been given consideration, even on the European-owned plantations.

Notwithstanding this delay in development, a recovery to the pre-war production level has been accomplished within thirteen years. The following figures,



Pre- and post-war figures for the export of copra from the Solomons are given in this graph, which shows that a recovery to the pre-war production level has been accomplished in thirteen years. (Since the above graph was prepared the actual export figure for 1959—21,685 tons—has been supplied.)

Land being cleared for coconut planting on the main north coast road on Guadalcanal.

supplied by the Department of Agriculture, show the pre-war export figures and the post-war recovery in copra exported.

Actually, 1956 shows an improvement on the pre-war average of 21,774 tons exported, while the figure for 1959 approximates it. However, it must be remembered that current high prices have promoted intensified harvesting, particularly on European plantations, while in the pre-war depression years, the disastrously low returns to both Europeans and Solomon Islanders retarded production. In short, had present prices obtained in pre-war years, the export of copra from the Solomons could well have been considerably higher than the average shown.

During 1958, copra produced from European estates was 12,049 tons, representing 58.5% of total production, while copra produced by native growers was 8,399 tons, or 41.5% of the total out-turn.

These figures show a definite increase in native production over pre-war years, when between 80% and 90% of the copra exported was recorded as having been produced by Europeans. This may be misleading unless it is known that in those days many of the traders who bought or bartered copra from the natives were Europeans, with plantations of their own. All their copra, whatever its origin, was recorded as being European-produced.

Today the position is reversed; some of the original European estates are now husbanded by native contractors who deliver their copra for export. This, together with all the traders' copra, is recorded as having been produced by Solomon Islanders, which is true. Nevertheless, in view of these facts it is very difficult to assess whether production from actual native plantings has increased or decreased from pre-war levels.

Taking into consideration the difference between present-day prices of around £80 per ton and the prices of about £5 to £16 per ton which obtained during the decade before the war, it might be assumed that all available coconuts are being harvested for copra by the native peoples.

In some areas close to the marketing centres established by the B.S.I.P. Copra Board, where advertised prices are paid to growers, native production may possibly be at its maximum. On the other hand, in the more isolated islands like the Shortlands in the west of the Protectorate, it has been estimated that only about 60% of the available coconuts grown in native groves are being converted to copra.

The reason appears to be that the average islander is still content to live at a near-subsistence level, and his need for imported consumer goods is limited. Returns from a few bags of copra suffice to give a family all it needs from a trader. Surplus coconuts may be used as food, or just wasted.

These growers know from their village radios the advertised prices for copra paid by the Copra Board. Their isolation forces them to do business with a visiting trader, but they are well aware of the difference between the trader's price and that paid by the Board. As a result, they become discouraged and so produce only sufficient copra to meet their basic needs.

Some of the traders pay very fair "beach" prices for copra, but the grave risk of losing their vessels in reef-infested waters, the very high premiums demanded for insurance on island craft, and the general shortage of inter-island vessels, all do not tend to promote maximum ex-shore prices for copra, nor lower charter rates for hired vessels.

More Copra Board Buying And Exporting Centres Needed

The B.S.I.P. Copra Board has established buying centres only in three places, at Gizo in the New Georgia Group, at Yandina in the Russell Group, and at Honiara in Guadalcanal. All three lie at great sea distances from many of the main copra-producing islands, and are the only points where a grower may obtain the Board's advertised prices for copra.

A well-established planter may be in a position to afford the purchase of a

(continued on page 54)

Right: Badly overcrowded native grove near Maliae village, Shortland Islands, B.S.I.P. The palm density in this grove is 260 to the acre. Extreme right: Palm damaged by the Solomon Islands rhinoceros beetle. The stem has been split into two separate trunks, both deformed.

Above: The main group of trainees arriving at Honiara. The first one-year course is being attended by twelve trainees from Fiji, Papua and New Guinea, Cook Islands, United States Trust Territory of the Pacific Islands, Western Samoa, and the Solomon Islands. Right: Some of the trainees outside the new air-conditioned printing shop that was specially built for the Course.

Literature Production Training Centre

Last February, twelve trainees from six Pacific territories assembled in Honiara, in the British Solomon Islands, to attend the first of three one-year courses to be held at the South Pacific Commission's Literature Production Training Centre.

By E. P. W. MARRIOTT*

EARLY last February a group of young men stepped from an aircraft at Kukum Airstrip, Honiara. Some of them had been travelling by air for over a week before reaching this "end of the line" in the British Solomon Islands. They had come from six different Pacific territories to attend the first one-year course at the South Pacific Commission's Literature Production Training Centre.

This Training Centre is an imaginative and realistic project which marks an important further step in the Commission's work in the field of literature promotion generally.

Specifically, by helping to provide trained staff and by investigating practical problems, its major purpose is to assist territories towards self-sufficiency in the preparation and production of printed matter designed specially for their own conditions.

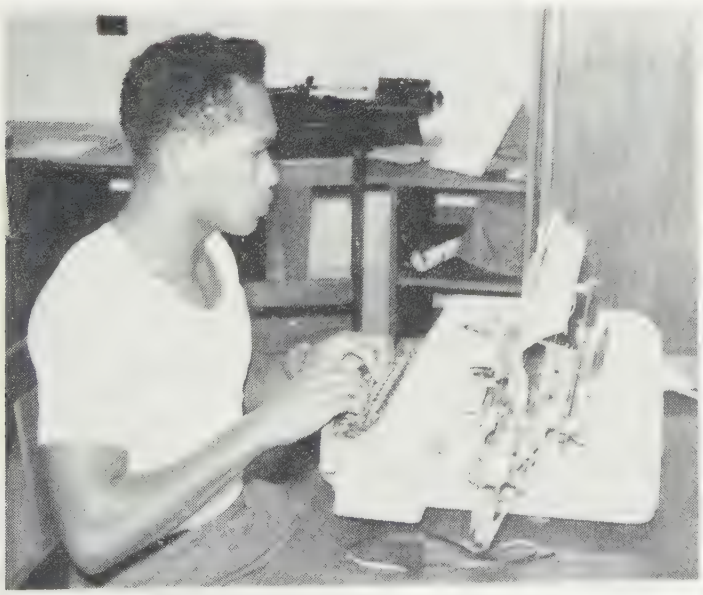
The Training Centre has been planned with the following objectives in view:

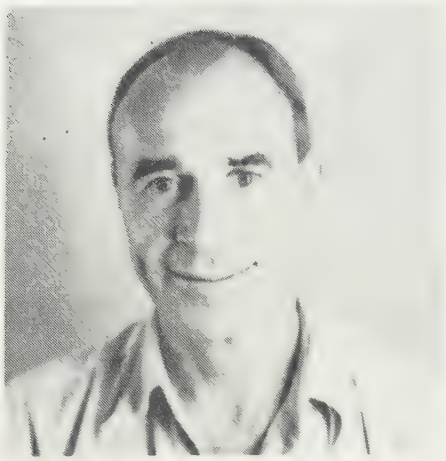
—to demonstrate what is possible on certain kinds of modern printing plant;

—to investigate the best means of operating and maintaining such plant in isolated, tropical places where commercial servicing and mainten-

* Editorial/Administrative Officer and officer in charge at the Training Centre.

Initial training in the Course includes practice in the office in composing on an electric typewriter (left), and, in the printing shop (right), instruction in operating a guillotine.





Left: Mr. E. P. W. Marriott, officer in charge of the Training Centre, has had several years of teaching experience in Papua and New Guinea. He has made a special study of reading needs for islands people, and is the author of several publications widely used in Pacific Island schools.

Right: Mr. A. M. Koenen, technical production officer for the Course, is a professional printer from Holland who has conducted training courses for printers in Surinam.

ance facilities are limited or even non-existent;

—to standardize procedures and materials with a view to simplifying administration and maintenance;

—to establish accurate costing procedures;

—to demonstrate some of the methods found useful for encouraging and organizing the preparation, production and use of literature specially designed to meet the precise requirements of individual territories;

—to provide training in these matters for men sponsored by governments or other organizations in the South Pacific.

Local Printing Facilities Essential

Our civilization depends on the printed word so completely that no country or territory can afford to rely on oversea sources of printing and literature. This applies particularly in the case of the Pacific territories, where isolation imposes considerable expense, difficulty and long delay in having a job done overseas, and where the cultural context demands special forms of literature unique to each territory.

Such literature may be instructional and for use in schools or in extension work in health, agriculture, co-operatives, local government, etc.; or for general recreational reading in the form of news sheets, magazines and booklets. In both cases profuse illustration is very desirable.

The economics of modern printing are based on the production of large quantities of material, which unfortunately territories seldom need. When only a thousand or so copies of a publication are needed, it is prohibitively expensive to use modern letterpress machinery capable of handling a wide variety of material. On the other hand, the simple kinds of traditional printing machinery, and the use of hand-set type, are too slow and limited in their range to meet today's needs.

The answer to the problem lies in the postwar development of "offset" printing —a type of lithography—which is comparatively cheap and simple, handles a wide variety of material (including several forms of illustrations, colour printing, posters, etc.), and is ideally suited to short runs of up to a few thousand impressions.

The South Pacific Commission, wishing to demonstrate this new technique of printing and to establish exact costs and methods of operation in a tropical island setting, formulated a plan for setting up a small offset printery equipped with sufficient ancillary plant to meet most requirements.

Support From UNESCO And B.S.I.P. Administration

Honiara in the British Solomon Islands was chosen as the location for the Literature Production Training Centre and its demonstration printery. The territory's Administration, which operated a small offset machine but saw the need to expand its printery, offered the fullest co-operation and support. Accommodation for staff and trainees was provided, and through a Colonial Development and Welfare grant, a new air-conditioned printery was built to the specifications of the Director of the Commission's Literature Bureau.

UNESCO was approached for technical and financial aid, and agreed to provide generous assistance. This included the purchase of the desired machinery, stocks of paper, ink, solutions and photographic material. UNESCO has also undertaken to pay the salaries of the staff—an Editorial-Administrative Officer and a Technical Officer—and to pay maintenance grants for all the trainees during the three-year life of the project.

The Centre comes under the full control of the South Pacific Commission within its social development programme, the actual project being developed within the field of responsibility of the Director of the Commission's Literature Bureau, Mr. Bruce Roberts, the author and architect of the scheme. As an adjunct of the Commission's Literature Bureau in Sydney, the Centre maintains close liaison with the Bureau, drawing on the experienced advice and assistance of its parent body.

The Commission is also responsible for finance for the administration of the Centre, a large part of the trainees' travel expenses, and sundry contingencies.

Variety Of Printing Jobs On Hand

At time of writing the twelve trainees for the first course have only just arrived in Honiara. They have a great deal to learn in the comparatively short time of one year, but as the existing Government printery has already been incorporated in the Centre, the trainees' exercises will be real jobs, and they will be working under the actual conditions of a printery rather than a classroom.

A variety of government forms—some simple, some difficult—await printing, while on the editor's desk is a growing pile of manuscripts. Contacts with officers in the fields of education, administration, health, and agriculture have revealed that there is plenty of work to be done once we have cut our teeth on the simple mechanics.

It is tempting to enlarge upon the plant and the uses planned for it; the trainees —who they are and where they come from—and the curriculum mapped out for them. But it would be preferable to wait until the course is really under way. It is hoped that in the next issue of the *Bulletin* these further details can be provided, together with an account of the official opening of the Training Centre.

The training course for leaders of Village Women's Clubs held at Popondetta last January was conducted by Miss Patricia Ure, Welfare Officer on the staff of the Native Affairs Department. Here she leads course members in community singing.

Village Women's Clubs In Papua and New Guinea

A training course for leaders of Village Women's Clubs was held at Popondetta, in the Northern District of Papua, from January 21-29 last. It was attended by twenty-four women from all parts of the district, and instruction included club management, the teaching of village hygiene, cooking, simple sewing, handicrafts, and the organization of recreational activities and sports. The first Village Women's Club was formed in Port Moresby in 1952. Today there are 120, located throughout the territory. The purpose of these Clubs, and the valuable work they are doing in improving the status of village women, are briefly described below by . . .

A. A. ROBERTS*

A field worker of the Department of Agriculture, speaking in the local Orakaiva language, tells the women attending the Women's Club course at Popondetta of the benefits of cash agriculture. He explained the important role that women play in the maintenance of crops such as coffee and cocoa.

SINCE the first club for village women was formed in the Port Moresby area during 1952 under the sponsorship of the Education Department, the number of such clubs has increased to 120, with membership of each group ranging from 12 to 236.

The clubs are located in practically all areas from the Sepik District to Bougainville, and from Western Papua to the Trobriands.

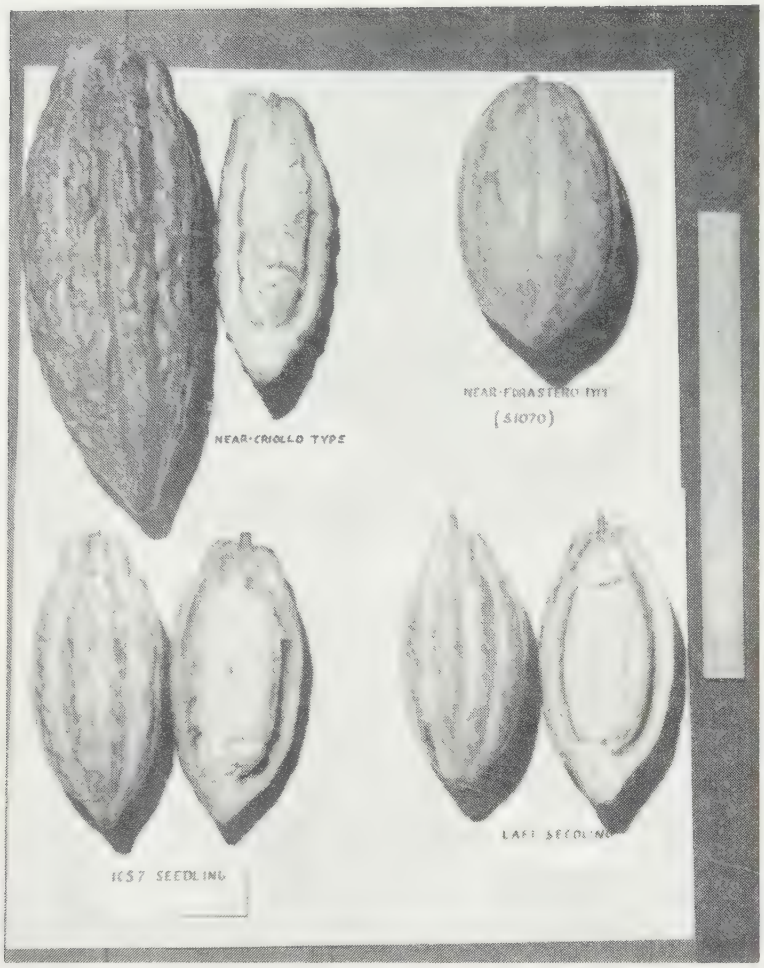
Five European women welfare officers are supervising the work of the clubs, and there are also many voluntary supervisors whose active interest in the individual clubs has helped greatly in the success of the movement.

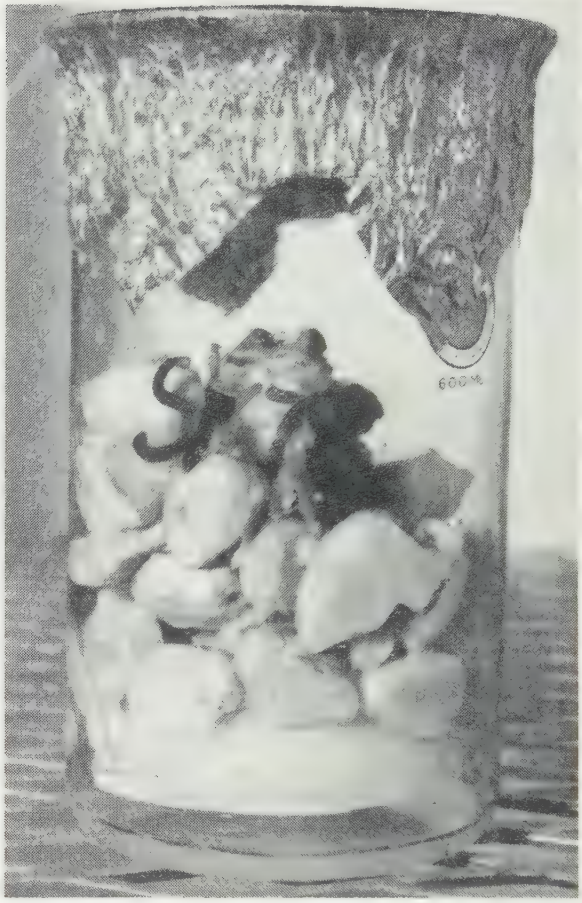
Each club chooses its own programme of activity, but in general their interests initially are centred on cooking and sewing, village hygiene, infant welfare, handicrafts and recreation. Once the clubs are well established they extend their interests to matters of general community concern.

Women's clubs at Kerema and Porebada have been responsible for organizing and partly financing the provision of a village water supply, having raised funds by making and selling grass skirts, handicrafts and clay cooking pots.

(continued on page 38)

* Director of Native Affairs, Territory of Papua and New Guinea.





Left: Types of cocoa pods produced at the Experimental Cocoa Station, Naduruloulou. Note extremely large pod at top left. Above: Seeds from a single cocoa pod being fermented by the Wadsworth-Howat method.

Cocoa Bean Studies In Fiji

Since 1953, Fijian farmers have been steadily planting cocoa. While waiting for these plantings to come into bearing, the Fiji Department of Agriculture has been able to compile a considerable amount of useful information on the quality of cocoas produced from much earlier plantings. A review of this work, together with some observations on fermentation problems, is given below.

By V. E. SILLS*

A CAREFUL study of the many variant types of cocoa beans produced by old established trees growing practically wild in Fiji was started in the Agricultural Department's laboratories early in 1955.

This project was the natural outcome of local interest in cocoa which had been aroused by a series of events beginning with the visit of Mr. D. H. Urquhart in 1952 and the publication by the South Pacific Commission of his report entitled *Cocoa Growing in the Fiji Islands.* This was followed by a period in 1954 during which the world market price of cocoa climbed steadily to the unprecedented peak of 560/- per cwt., due in part, it was said, to a short crop in West Africa; 18 months previously the price of cocoa had been reasonably stable at about half this value.

Finally, Fiji received a visit from Messrs. Paul and Adrian Cadbury of the well-known chocolate firm of Bournville. This visit was part of a world tour designed to foster interest in cocoa growing in those countries outside the main cocoa-producing centres

Vigorous Cocoa-Planting Campaign Sponsored By Department

In response to much encouragement, and with the aid of Colonial Development and Welfare Funds, energetic measures were taken by the Department of Agriculture to establish cocoa nurseries and to encourage planting by Fijians in those parts of the islands where growing conditions were considered to be favourable for cocoa. But then came the problem of where to find an adequate supply of suitable planting material. Fiji was, however, fortunate in two respects: there were several thousand trees in the Colony which had

* Biochemist, Department of Agriculture, Fiji.

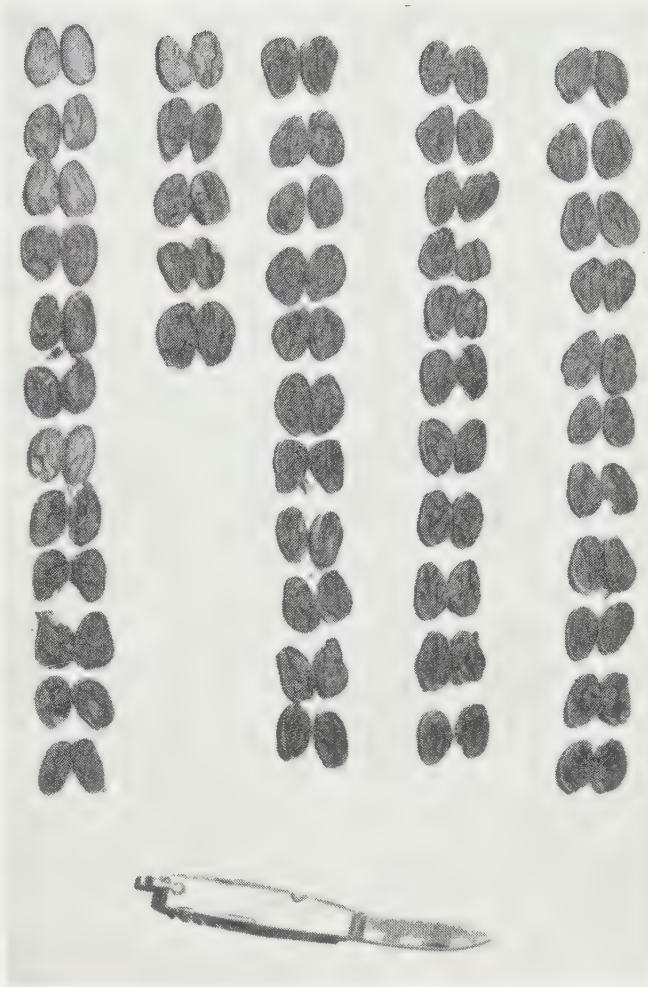
resulted from the plantings of the early part of the century, and there was a nucleus of high-yielding clones established at the then Plant Introduction and Quarantine Station, Naduruloulou, which had been introduced from Trinidad and Western Samoa via Kew a few years previously. Unfortunately, the trees from the early plantings were widely scattered throughout the islands and were mostly in a poor condition; little was known of their origin except that seed had once been imported from such places as Java, India, Singapore and Western Samoa. Obviously the first thing to do in order to ascertain the potential usefulness of this cocoa was to conduct a survey, and this was in fact carried through.

Besides drawing our attention to the value of cocoa as an economic crop, the visit by the Cadbury principals brought to our notice the significance of a discovery which had been made a few months earlier by two members of the Cadbury research team. This was the Wadsworth-Howat small-scale fermentation method of testing cocoa from individual trees. It meant that, by using this new technique, we could determine the flavour characteristics, and therefore the true quality, of the cocoa from each of the trees provisionally selected by the survey team for vigour, yielding power, resistance to disease, and so on. It opened the door to the development of clones from local planting material.

As it was, when supplies permitted, only seeds with purple cotyledons were being used for the production of seedlings in the nurseries. The reason for this step was that it had been decided to strengthen, as far as possible, the Forastero element in new plantings in order to give Fiji cocoa additional strength of chocolate flavour. Nine-tenths of the world demand for cocoa is met by Forastero cocoa—largely on account of the good chocolate flavour which is obtained from it.

Laboratory Investigations

From 1955 onwards, single pods from selected trees were received by the Department's laboratories for comprehensive quality tests, which included chocolate flavour assessment. The seeds from each pod were fermented separately by the Wadsworth-Howat method (see photograph) and dried. As the laboratories at this time were not equipped to prepare chocolate samples the Cadbury research department generously offered to help with this aspect of the work, and over a period of three years supplied flavour reports on 238 samples of dried beans (representing 145 trees) which had been submitted to them. Of the trees tested in this manner, four were eventually earmarked for clonal propagation: they were S535, S77, S61 and S1070.



Showing the 'cut' test for dried cocoa beans. The beans in the first column on the left showed purple colours; the remainder were light or dark-brown with open cotyledons.

Most of the trees selected for cocoa flavour assessment were found to possess strong Criollo characteristics. The colour of the cotyledons of the fermented and dried beans usually appeared pale brown or cinnamon brown, while the flavour of chocolate prepared from these beans was frequently weak in strength and sometimes characterized by one of several ancillary flavours. Liquorice, raisin and caramel were common ancillary flavours; others were occasionally reported as being floral in character or reminiscent of bitter almonds, while others still were described as being unpleasant in character.

On the other hand, there were many cocoas with mainly Forastero characteristics. The fermented and dried beans showed dark brown or chocolate brown cotyledons and the flavour of chocolate prepared from them sometimes came within the West African flavour range. Clearly the majority of the existing trees of "local" origin were of a typical hybrid type, but, here and there, trees with pronounced Forastero or Criollo characteristics were to be found.

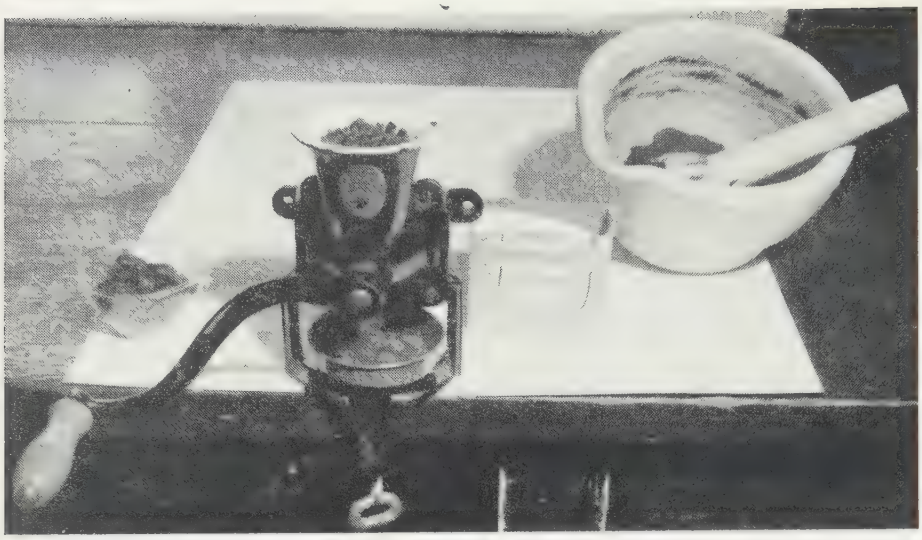
In addition to the appraisal of cocoas in respect of flavour, much information concerning other physical characteristics was collected. For example, bean size, shell content, cocoa butter content and some physical constants of the cocoa butter were recorded.

Bean Size

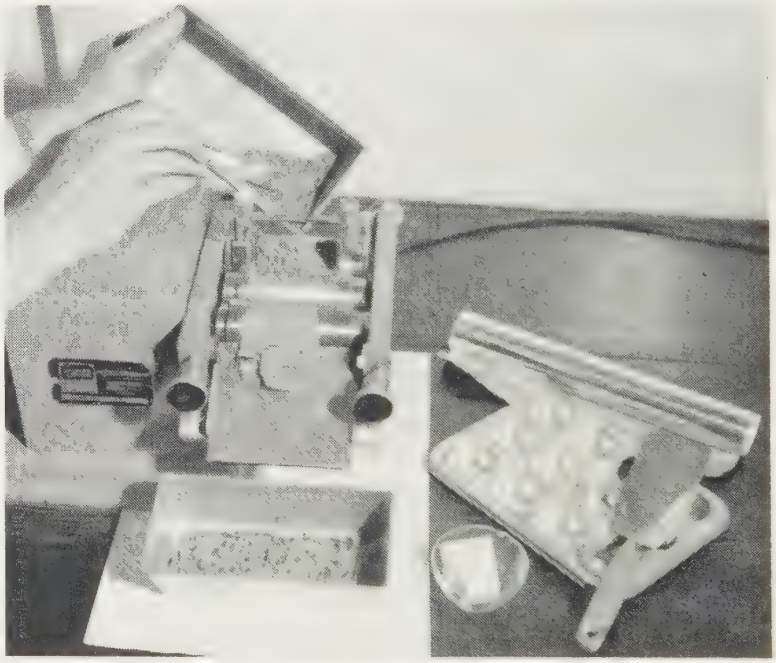
The minimum weight of dried bean generally acceptable to the chocolate industry is about one gram. The beans of Fiji cocoas are usually well above this value, as might be expected for hybrid material, although instances occasionally occur of individual trees giving bean weights as low as 0.6 g. At the other end of the scale a few local selections, including S1070, have produced average dried bean weights of 2.0 g; the highest ever recorded was 2.5 g from ICS 40.

Shell Content

The testa or shell of the cocoa bean serves a most useful purpose in providing the cotyledons with protection against the attacks of insects. But apart from this protective role the shell is of little commercial value to the chocolate maker, and for this reason it is not considered economic to purchase cocoa



Above: The first stage of grinding cocoa nibs in the preparation of chocolate.



Right: The second stage of chocolate preparation, showing the triple roll refining mill in action with deodorized cocoa butter and moulding utensils alongside.

beans containing more than 12 per cent of shell.

The shell contents of the many types of Fiji cocoa beans have been found to lie between 7 and 18 per cent, but the first commercial samples produced from field-scale fermentations gave average values of the order of 12 to 13 per cent.

Cocoa Butter

One of the most valuable constituents of the cocoa bean is its fat, or cocoa butter. Normally the fat represents about half the weight of the shelled bean.

The analysis of 44 samples of Fiji cocoa beans gave an average fat value of 50.4 per cent which, though satisfactory, compares somewhat unfavourably with the value of 54.0 per cent which was found for samples of West African Amelonado beans. However, the Lafi seedlings, which originated from Western Samoa, were better with an average value of 53.3 per cent.

An interesting example of the care that is needed in selecting cocoa trees for clonal development work occurred as a result of testing the beans of a number of seedlings of S1070 for fat content. The analysis revealed unusually low values ranging from 41 to 48 per cent. The parent tree, S1070, fortunately proved satisfactory with 50.3 per cent.

Information about the composition of the cocoa butter from various samples of beans was afforded by the determination of iodine numbers; in every case these constants were found to be quite normal.

Fermentation Studies

Advantage was taken of the routine preparation of fermented beans from single pods to learn something about the effect of the duration of fermentation on the development of chocolate flavour precursors, particularly in the beans showing predominantly Criollo characteristics. Strictly speaking, it is necessary to refer to precursors of chocolate flavour because the development of the full chocolate flavour does not occur until the beans have been roasted.

In brief, it was found that slightly better flavour assessments were received for Criollo-type cocoas which had been aseptically fermented for four days (two days at 35° C and two days at 50° C) as compared with the normal fermentation period of 6½ days (3½ days at 35° C and 3 days at 50° C).

Overseas Reports

At the beginning of 1958 there was still insufficient cocoa being harvested in Fiji to provide the material for field-scale fermentations. In order, therefore, to obtain a few advanced commercial opinions of the quality of Fiji cocoa it was decided to prepare laboratory samples of sufficient size to be of interest to overseas buyers. Accordingly, fermented and dried beans were prepared from 40-pod lots, using yeast starters and incubators to maintain optimum working temperatures.

The results of these small-scale fermentations were not entirely satisfactory, but they did provide the material from which a rough guide as to the inherent quality of Fiji beans could be obtained. Most of the reports received were critical in two respects: firstly, the proportion of under-fermented beans was considered too high (it varied from 24 to 34 per cent) and, secondly, it was considered that the ancillary flavours were unduly strong; chocolate flavour was reported as mild or of medium strength. The general impression received from these reports, however, was that Fiji cocoa would have no difficulty in holding its own on world markets.

Chocolate Preparation And Tasting

For a modest cost of £stg 100 a Pascall's triple roll mill was installed in the laboratories at Suva in order that chocolate could be prepared from small samples of experimental beans. Chocolate preparation on a laboratory scale consists of roasting the beans, shelling, grinding and adding sugar and deodorized cocoa butter in the correct proportions. Refining, an essential part of the process, is performed by means of the triple roll mill. Finally, the refined chocolate is tempered and moulded;

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when cool the tablets are tapped out of the moulds and wrapped in metal foil.

Perhaps the most arduous of the tasks involved in a laboratory concerned with chocolate making is the organizing and bringing together of a tasting panel. Once more the Department was indebted to Messrs. Cadbury Brothers Ltd., for their help in providing advice and test chocolates with which to determine the suitability of various people for tasting work. Of the twenty persons tested, eight eventually proved acceptable.

The tasting panel was found to work well when chocolate samples were submitted in pairs, a "known" or standard sample of chocolate being compared with an "unknown". A successful system of assessing flavour, depending on points awarded for strength of chocolate flavour and on points deducted for undesirable ancillary flavour, etc., was also adopted.

Field-Scale Fermentations

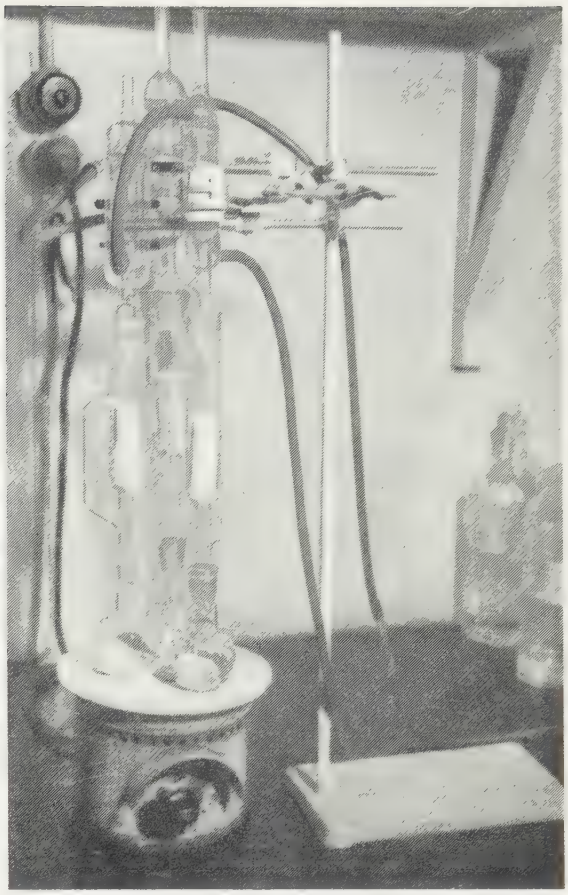
Towards the end of 1958 it became possible to organize bulk fermentations at the newly-built fermentary with its Samoan-type drier at Naduruloulou. Reports on the results of the first experiments were quite satisfactory, although some comments referring to acidity arising from a vinegary type of fermentation and to a pronounced caramel-like ancillary flavour convinced the writer that, to get the best possible results, it would be necessary to experiment a good deal further. Unfortunately, the hurricane of 2nd December, 1958, has prevented the continuation of the experimental field-scale fermentation programme up to the time of writing.

It is perhaps not out of place to mention here that although frequent reference has been made to the occurrence of ancillary flavours, the factory processing of chocolate removes many of the unwanted background flavours which are prominent in laboratory-prepared samples. It is therefore possible to over-emphasize the importance of minor flavour defects, for these may automatically disappear during factory processing.

Short Period Fermentations

Reports from the West African Cocoa Research Institute by Allison and Rohan (1958) have indicated the practicability of producing well-fermented cocoa beans after a 60-hour fermentation, using trays filled with cocoa beans to a depth of 4 inches.

A trial at Naduruloulou on these lines gave a disappointing result, perhaps due to lack of temperature control, but one interesting fact emerged. The fermented sample contained a higher-than-usual percentage of purple and white beans, as judged by the "cut" test, but when chocolate was prepared from this cocoa from which the purple and white beans had been removed, the resulting chocolate flavour was found to be good. It could therefore be argued that the majority of the beans had been well fermented after 60 hours of fermentation and that, if a simple method of distinguishing these beans could be devised, a great deal of time would be saved in the fermentary.



A Soxhlet apparatus for the determination of cocoa butter in cocoa beans.

Future Policy

Now that a useful selection of introduced clones is well established at the Experimental Cocoa Station, Naduruloulou, it is opportune to make good use of this material in the current plant breeding programme. Following the advice of Dr. S. C. Harland, who recently visited Fiji, attempts are being made to breed high-yielding paired crosses from both introduced and local clones. Other interesting possibilities are afforded by the recent planting-up of an isolated block of West African Amelonado cocoa, introduced from Malaya, from which useful comparative studies may be expected. Such a programme must include intensive laboratory studies of the beans produced by these new plants in order that the new selections may be approved for bean size, flavour, shell content and so on. When the final selections have been made and issued to the cocoa farmer, a considerable step forward in the progress of cocoa production in Fiji will have been achieved.

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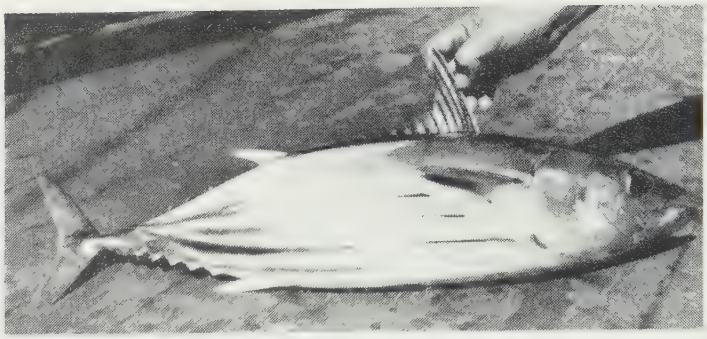
Commission's New Executive Officer For Health Arrives

On February 20 Dr. T. K. Abbott arrived at Commission headquarters to take up appointment as executive officer for health. His last post was that of assistant director of medical services in the Department of Public Health, Papua and New Guinea.

Dr. Abbott succeeds Dr. Emile Massal, who resigned in April of last year after ten years of service with the Commission. Dr. Massal is now director of the Medical Research Institute of French Polynesia, with headquarters in Papeete, Tahiti.



Above: The skipjack is often taken by trolling off New Caledonia, sometimes at considerable distances from land. Right: The yellowfin is the tuna most commonly taken in New Caledonian waters by trolling, mainly near the outer reef and in the vicinity of passes.

Trolling And Longlining For Tuna

The French Institute of Oceania has published two illustrated booklets recording the results of experimental tuna fishing carried out by its fisheries research vessel Orsom III, *over a period of several years. Two techniques for commercial use—trolling and longline—were finally selected, and each is the subject of a separate report. Both are reviewed below by . . .*

LOUIS DEVAMBEZ*

TROLLING for tuna is described in *Possibilités de Pêche Artisanale du Thon en Nouvelle-Calédonie (Possibilities Of Small-Scale Commercial Tuna Fishing In New Caledonia).* This booklet also gives a clear description of tuna species of common occurrence in New Caledonian waters, and of some other fishes often caught while trolling.

From a survey of the various tuna fishing techniques used in the world, trolling emerges as the only method suitable for small-scale commercial fishing.

The equipment used on board ORSOM III is briefly described, and some actual results are summarized, giving a general idea of the scope of this technique.

In the chapters dealing with the adaptation of local fishing cutters for this type of fishing, the gear and its installation are described in detail, and illustrated with clear line drawings (several are reproduced with this review).

The fishing technique, the best fishing areas, spotting of schools, and actual fishing operations are explained in such a way that fishermen can immediately put them into practice.

At the end of this section, advice is given on the adequate preservation of the catch.

Finally, the prices of a few items of gear (lines, hooks, lures, etc.) are quoted, and some advice is given to the reader on how to keep detailed records of catches.

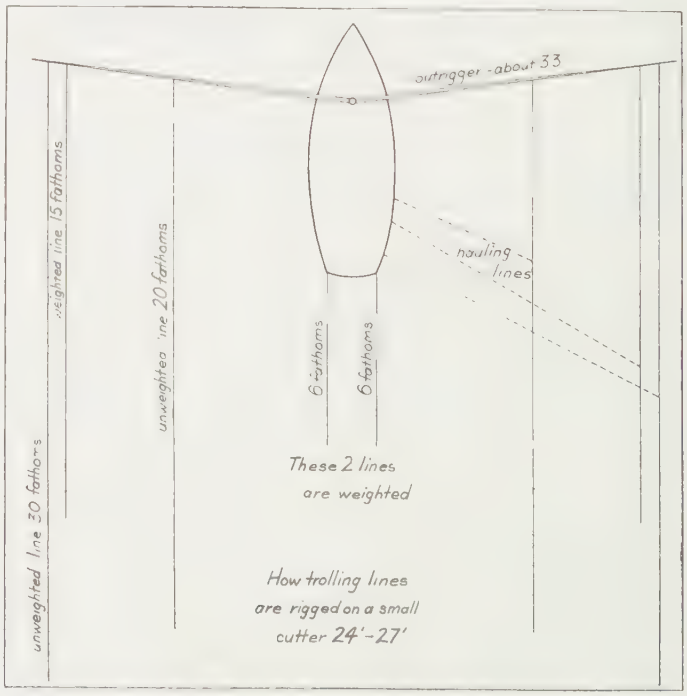
The booklet will undoubtedly be of great interest to all fishermen in the area.[1]

[1] The publication of an English edition of each booklet is under consideration.—Editor.

La Pêche du Thon à la Longue Ligne (Tuna Fishing By Longline) opens with a historical survey of the floating, or Japanese, longline. There follows a brief description of this technique as used in Japan and Hawaii, and of the experimental fishing and of the mechanized gear developed by Pacific Oceanic Fishery Investigations, a research organization of the United States Fish and Wildlife Service.

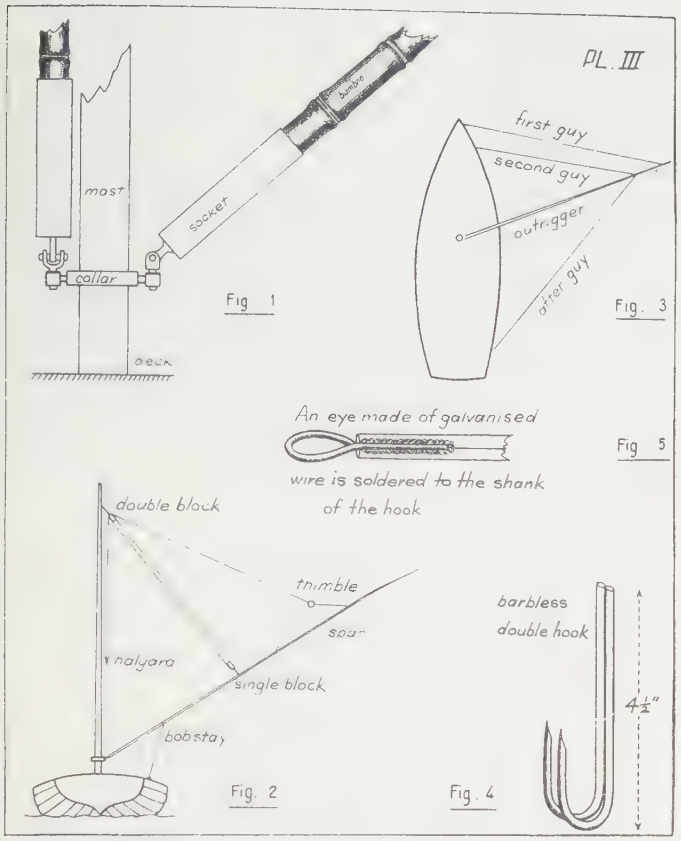
The authors then give a detailed account of fishing trials made on board ORSOM III: the deck installations, the gear, its rigging and preservation, and, finally, the actual operation of the longline. All of these subjects are treated clearly and concisely.

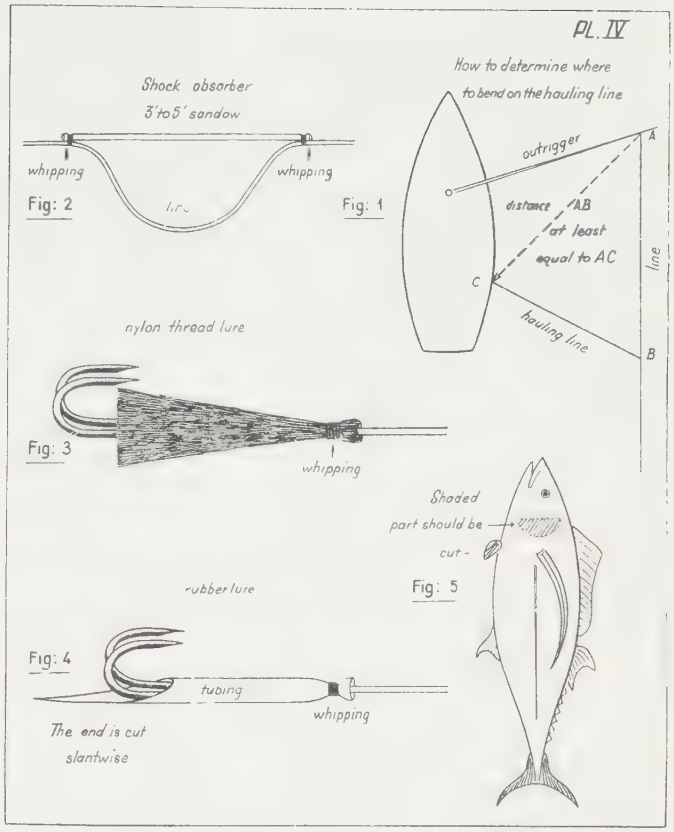
A brief analysis is made of results obtained by ORSOM III. The authors conclude that longlining could be used for


outrigger - about 33
weighted line 15 fathoms
unweighted line 20 fathoms
hauling lines
6 fathoms
6 fathoms
These 2 lines are weighted
unweighted line 30 fathoms
How trolling lines are rigged on a small cutter 24'-27'

Plan view of a small cutter fitted with outriggers for trolling.

* Assistant Fisheries Officer, South Pacific Commission.





Details of rigging, lures and shock absorbers are given in the above sketches.

the commercial exploitation of deep swimming tuna in the vicinity of New Caledonia.

South Pacific fishermen interested in trolling and longlining for tuna will find valuable guidance in these booklets.

Copies can be obtained on request from M. le Directeur de l'Institut Français d'Océanie, Nouméa, Nouvelle-Calédonie.

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Tilapia A Useful Food In The Cook Islands

The pond fish Tilapia, which was introduced to Rarotonga a few years ago by the Commission's fisheries officer, Mr. H. van Pel, is thriving in taro swamps and other freshwater areas on the island.

According to the fisheries officer for the Cook Islands, Mr. Ronald Powell, tilapia now form a very useful subsistence food for many families with young children, who go fishing for them regularly with rod and line after school hours.

"Some families catch a kerosene tin full in this way," writes Mr. Powell, "and in this 'fish hungry' island that is well worth while. Tilapia are here to stay in all the Cook Islands, and while it is unlikely they will ever meet the demand that exists for fish, they are certainly making a useful contribution to it among the section of the people who need it most."

Training Courses For Cook And Niue Public Servants

Many public servants in the Cook Islands, and on Niue Island, will in future have a better chance to qualify for promotion under a staff training scheme now being finalized. Courses in technical subjects are expected to begin in April, and officers will sit for an examination after a year's study.

The scheme provides for from four to six hours' supervised study for officers each week, part during working hours and the remainder in their own time. The five subjects in the examination vary from one branch of the service to another, but examples are clerical and secretarial practice, general accounting, and radio communications and maintenance. There will also be special instruction in subjects relating to health, agriculture, drafting and typing. In all courses, English will be a "must" subject.

Courses will be compulsory for all public servants in the Cook Islands and Niue up to the age of 35. Candidates in the outer islands, which are scattered over some 850,000 square miles, will study by correspondence.

Training Fishermen In Papua and New Guinea

Special classes lasting about three months are being held for indigenous fishermen in Papua and New Guinea. They are trained both ashore and as crew members of Administration vessels. Subjects they are being taught include the making and repairing of fishing gear, simple fish biology, ocean currents, and fish conservation.

The main object is to give them first-hand experience in modern methods suited for community fishing. Later, trainees will man mechanized native fishing fleets and trawlers.

After completing the three-month course, specially-selected trainees are being given a further three years' training as fishermen's assistants. Depending on the qualifications they obtain, they will either be stationed at various points in the territory to assist local fishermen or will take part in fisheries survey work.

Hurricane damage on Niue. Left: Remains of a Niuean home. On the left of the picture can be seen one of the relief tents delivered by air-drop soon after the hurricane. Centre: Hastily erected hut. Right: A cook house contrived from galvanized roofing iron.

Housing For Hurricane-Swept Niue

Following the disastrous hurricane which devastated Niue in February, 1959, destroying or damaging over five hundred houses, the New Zealand Government set up the Niue Housing Loans Scheme. After visiting Niue, a New Zealand architect designed two basic types of house, both using local materials as much as possible and planned to withstand hurricane-force winds. Since September last, when the Scheme began to operate, several hundred loans have been made and the rebuilding programme is proceeding steadily.

By JOHN KEATING*

AS a result of the disastrous hurricane which struck Niue with such devastating force on 26 February, 1959, the people of Niue are now engaged in the task of restoring their shattered island and rebuilding over 500 houses in concerted communal activity, with the financial support of the New Zealand Government and gifts from all over the world.[1]

Niue, with a population of 4,700 and a total land area of a little less than one hundred square miles, is on the edge of the hurricane belt, although severe hurricanes like that of last February are, fortunately, rare.

In the past, Niueans have been outstanding for their industry, thrift and sturdy independence, and the plan for rehabilitation provides for preserving this spirit of self-reliance. Hence, emphasis has been placed on "aided self-help" and community effort.

The recent adversities suffered by the Niuean people have left them temporarily without a source of income, as their coconuts were destroyed by the hurricane and they will be unable to export copra for some considerable time. Moreover, the prolonged drought of 1957 severely impaired the island's economy, and food and export crops which had been retarded by the drought were dealt a further blow by the hurricane.

Generous assistance, however, not only from New Zealand but also from all over the world and from international organisations like CORSO, the International Red Cross and the World Council of Churches, is helping the people of Niue to re-establish themselves. Gifts of food and clothing have provided immediate relief for the many people who had lost all they possessed.

[1] A further hurricane swept Niue on January 18 last. While general damage was again widespread, the housing reconstruction programme was not seriously interrupted.—Editor.

Houses built of coral-lime blocks to approved designs such as this partially-completed dwelling in Vaiea village, withstood the hurricane without damage.

* Department of Island Territories, New Zealand.

The problem of providing permanent shelter now remains to be overcome, and to prevent hastily-constructed dwellings from creating sub-standard living conditions it has been necessary to plan with celerity. The unexpended balance of donations of money amounting to approximately £8,000, deposited in a central fund, has become the nucleus of a scheme to re-house the people. The gifts of money received from all over the world have been reserved to provide permanent accommodation for the island's aged and infirm and those unable to help themselves, and to provide a discount on all housing materials.

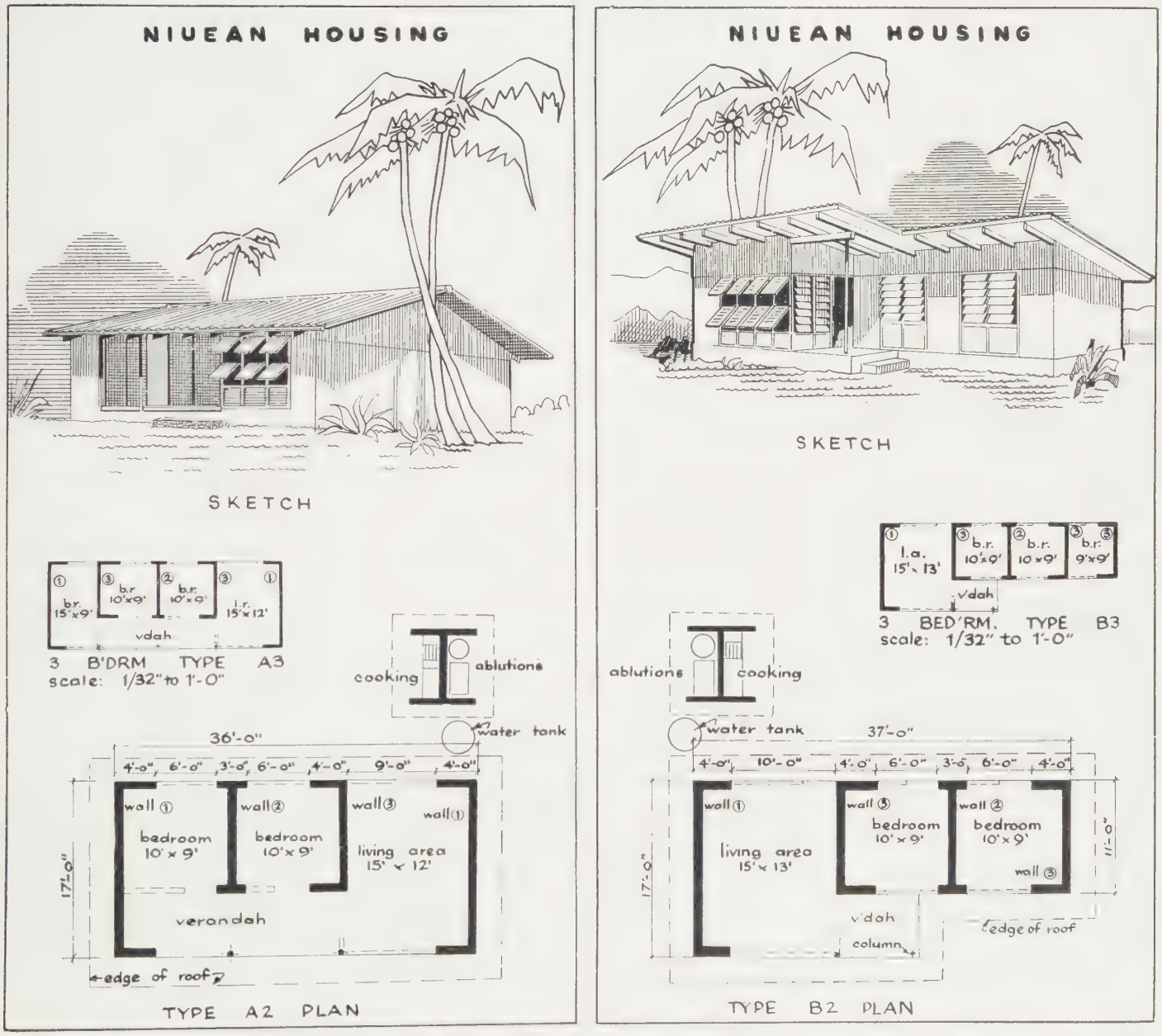
It is on the finance made available to the Niue Island Assembly by the New Zealand Government that the housing loans scheme has been based.

Housing Loans Scheme

Reconstruction on Niue commenced immediately after the hurricane with the introduction of a Housing Loans Scheme on a basis of "aided self-help." Early in March Mr. F. Ponder, Sectional Architect of the New Zealand Ministry of Works, was sent to Niue to report on the damage and to make proposals for rebuilding which could be incorporated into a permanent relief scheme to provide homes.

Mr. Ponder's survey showed that 167 houses were completely demolished, 156 were damaged beyond repair, 116 were repairable but badly damaged, and a number were required to overcome crowding, thus making a total of 514 homes to be either built or repaired.

Since the advent of Christianity the Niuean people have endeavoured to house themselves in European-style homes of simple and modest design, the cost being met by years of careful saving from their small incomes. To perpetuate this ideal, Mr. Ponder has designed a series of suitable houses utilising local materials as much as possible, and capable of being erected by com-



Plan and elevation of each of the two basic types of house designed by a New Zealand architect specially for Niue. They are planned to withstand hurricane-force winds and to afford maximum light and fresh air. Local materials are being used in the construction as much as possible.

munal working parties of semi- and unskilled labour.

These houses are planned to withstand hurricane-force winds and to afford the maximum of light, fresh air and shelter.

Two Basic Types

There are two basic types of house, each with two bedrooms. Additional bedrooms can, however, be built if needed. Each house is a solidly-constructed and self-contained unit of living and sleeping quarters. A feature is that the standard type walls are provided in three shapes only. Detached cooking and ablutions blocks have also been incorporated in the plans. Each house is roofed with asbestos which has proved that it can withstand high velocity winds better than corrugated iron.

Full provision has been made for water storage. As Niue is entirely dependent on rain catchment for water for all domestic purposes, each house will be equipped with a 400-gallon water tank, which, together with the village tanks, will ensure that the Niueans will be prepared for future droughts.

Every house will also have its own pit-latrine, but these will be housed in sets of four in order to provide less—and more hygienic—outhouses and larger pits.

It is estimated that the total material cost of one of these houses and outbuildings will be £150. Although they represent the minimum requirements, they will nevertheless provide the people of Niue with a standard of accommodation of which they may be justifiably proud.

Niue is fortunate in possessing some building materials. In most of the island's fourteen villages there are abundant deposits of coral suitable for burning into lime. Similarly, coral sand and coral rocks for crushing into chips are readily available, and these provide the basic essentials for the construction of a house.

The island also has some large natural stands of good building timber, and the Administration operates a small but well-equipped sawmill, which will process all the timber for the new homes.

In a small experimental housing project commenced a few years ago in the model village of Vaiea, valuable experience was gained in the use of these materials, and it is noteworthy that these were the houses which withstood the hurricane of February last year.

Experiments have also been conducted with the use of poured coral lime, coral-lime blocks, lath and lime plaster, and weather boarding, in the construction of a variety of house designs.

Scheme Operated By Niue Islanders

The Niue Island Housing Loans Scheme is simple, and its operation is in the hands of the Island Assembly and the people themselves. In September 1959 the Niue Island Assembly, constituted by the Cook Islands Amendment Act 1957, replaced the former Island Council. It now consists of fourteen members, or one representative from each village, together with the Resident Commissioner as President. The reconstituted Assembly is empowered to borrow money and to make loans.

To promote immediate rehabilitation, the New Zealand Government made available to the Niue Island Assembly a sum sufficient to enable the Assembly to make individual loans of up to £150 for each house built to an approved specification and under certain conditions. Of this amount, £50 is by way of a suspensory loan that will be cancelled when £100 has been regularly repaid over a period of ten years.

The Assembly, by making a grant of £3,000 from the available gift money of £8,000, has enabled a discount to be given on cost of all materials supplied from the Administration's Public Works Department store. Moreover, the establishment of an insurance fund based on a single premium of £5 for each £150 loan will automatically discharge a grantee's debt in the event of his death or inability to repay his loan. This part of the scheme was introduced to accommodate the difficulties in an island where land tenure makes it virtually impossible to create mortgages. Thus, loans become personal agreements which die with the grantee.

Special Assistance For Helpers

The Loans Scheme also offers special assistance to those who for some justifiable reason are unable to help themselves (e.g. widows and deserted wives), or who have no source of income. Here the gift money will be used immediately to pay off the loan and still obtain the New Zealand Government offer of £50 suspensory loan.

The Assembly has also made provision for the island's aged, and will offer for free tenancy to approved elderly persons, prefabricated self-contained dwelling units which can be bolted to concrete foundations on the tenants' own land. These units, however, will remain the property of the Island Assembly for re-allocation to other deserving cases after the death of the original occupant.

Any person whose home has been destroyed or damaged in any way by the hurricane is eligible to apply for assistance under the Scheme. Naturally the most urgent cases—those without homes at all—will receive priority, but any person may present his case to the Island Assembly through his Village Housing Committee.

A major problem was the necessity to give the people a full understanding of the Housing Loans Scheme, their obligations under it and the benefits which they might obtain from it. This was achieved by numerous village meetings held by the Resident Commissioner, the Secretary of the Department of Island Territories (who visited Niue for that purpose), and the housing supervisor.

In addition a comprehensive booklet was produced for every householder. This booklet explained in detail the implications of the Scheme and answered a series of questions which it was expected might be raised by the people. It also included house plans, specifications and application forms, as well as instructions as to how to complete them. Furthermore, publicity was given in the island's fortnightly newsletter.

Village Housing Committees

Each village on Niue now has its own Village Housing Committee which is the link between the people and the Island Assembly. It is the Village Housing Committee's responsibility to scrutinise every loan application and to ensure that it is in order; to determine that the applicant is deserving of assistance under the Scheme; that he has a right to build on a particular piece of land; and that his building group has in fact agreed to work together.

The houses will be built by groups of from six to ten men each, who will guarantee to help each other and to work under the direction of two trained housing supervisors whom the Administration has employed for this purpose.

The Village Housing Committees are also authorised to settle any problems that may arise in connexion with the Scheme, and will assist and facilitate the contact of the housing supervisors with the people. Through the Village Housing Committees, the villagers are already receiving training in future village government (a step envisaged in the Cook Islands Amendment Act 1957) for the enactment of village by-laws and the regulation of village affairs.

The present Village Housing Committees, which have been established by the Island Assembly to which they are responsible, include in their membership the leading men in each village.

Procedure For Obtaining Loans

Each applicant must apply for loan assistance through his Village Housing Committee, which will examine his application and make a formal report to the Island Assembly, recommending the appropriate action. The Island Assembly alone may authorise the granting of assistance for rebuilding.

The application form is a questionnaire which requests information on the applicant's income and resources, his title to land and his authority to build on it, the extent of house damage attributable

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Women's Health Committees In American Samoa

In eighteen months, twenty-six Women's Health Committees have been formed throughout American Samoa. The aims and activities of these Committees are described in this article by . . .

ARIETA MULITAUAOPELE and LEONIE MARTIN*

The Commission's health education officer, Miss Leonie Martin, discussing practical aspects of good nutrition with the members of the A'oa Women's Health Committee in their fale.

SOME eighteen months ago, after a great deal of preliminary work, Women's Health Committees were established in some villages on Tutuila Island. The first was formed in the village of Fagasa in September, 1958. Others quickly followed, and now there are twenty-six Women's Health Committees scattered through Tutuila and Manu'a Islands.

These committees were developed for the express purpose of helping the Public Health Section of the Department of Health—and particularly the local public health nurses—in their villages. They are an important link between the village community and the health services, and are making a unique contribution to the total health programme, particularly in the field of health education.

As each committee is formed, the members begin working towards building a fale for their own use. It becomes their meeting place as well as a centre for baby clinics and school health examinations. In some ways, therefore, it becomes a recognized centre not only for the members of the committee, but also for the entire village. In some cases it can be used as an emergency hospital, one member always being available for duty there. In the fale is a cupboard to

* Mrs. Mulitauaopele is Chief Public Health Nurse, Department of Public Health, American Samoa. Miss Martin is Health Education Officer, South Pacific Commission.

Above: The Women's Health Committee fale at Masefau village on the northern side of Tutuila Island (reached only by boat or by a long climb across the mountain). When this picture was taken the meeting in progress was being addressed by Mrs. Arieta Mulitauaopele, Chief Public Health Nurse. Right: "School Health Programme" at Faganeanea School. Dr. Ruthig, the paediatrician, assisted by a District Nurse, is checking for ear infection. Each child is given a physical check and any needed immunizations or boosters.

hold the village drug supply (the key being always available from one of the members, even if the nurse is away).

But the committees can do more than just provide their own material facilities. They can also take the lead in inspiring the village to improve its general health facilities, and, even more important, they can educate the rest of the community in using facilities provided and in generally improving their standard of health.

They can help with the development of kitchen gardens and the use of a wider variety of foods and a better balanced diet. They can, with training, provide emergency first aid when it is needed.

Already there have been some remarkable results from the work of these Health Committees in the village life of the people of American Samoa. More mothers are beginning to understand how to look after their children properly, and how to keep their homes and living areas clean. Infectious diseases are being discovered much earlier. Co-operation is better, and there is greater understanding of the causes of diseases and means of prevention.

Varied Practical Activities

Some of the work being done by these women is very practical, such as disposing of empty tins, coconut shells, and other containers that can hold water where filariasis-carrying mosquitoes can breed.

The clearing of rubbish round houses and in villages helps to lessen the breeding of flies, which can spread many sicknesses. A monthly "sanitation inspection" is an excellent way of keeping a village clean.

The women can also ensure that the water supply to their homes is pure, and contribute money towards the building of latrines. They can help the village nurse by encouraging mothers to bring their children for treatment and immunization at the right time, and by ensuring that they return at the right time for following injections. And all the members can help, too, in teaching mothers the proper way to feed and care for their children.

Committees An Important Part Of Village Health Service

The Women's Health Committees have become an important part of the service that is being developed by the Public Health Department to prevent disease in the villages. Not only can the mothers learn about proper sanitation and other preventive measures in the field of health, but they can assist with general social and economic improvement and the raising of standards. In this respect their position is unique, and they can take much pride in their efforts on behalf of their own people.

Village Women's Clubs

(continued from page 27)

The Tsiria Village Women's Club at Yule Island took over an old building and converted it into a club house, and purchased a stove for use in cooking classes. At Kikori the local club has bought a sewing machine, and the Sohano Club conducted a very successful Baby Show. In the Kairuku area club members have planted a banana garden of 15 acres and the crop is to be sold to Women's Clubs in Port Moresby.

Many of the clubs are devoting a great deal of attention to village hygiene. Club officials make a weekly inspection of each member's home, and ensure that rubbish tips and latrines are kept at approved health standards.

Clubs Give Women New Status

The clubs, however, have an influence much wider than that indicated by their scheduled activities. They give the women a new status in their communities which enables them to play a much more active part in improving village life. Also, they provide a driving force in getting practical projects undertaken by the men, since once a community undertaking has been discussed and approved by club members, a favourable public opinion has been created which acts as a challenge to the men.

The clubs also meet a very special need in relation to adult education for village women, as, by tradition, women's interests have been limited to home life and work in the food gardens. Thus they have lacked the outside contacts which very materially assist the general advancement of the men of both urban and rural village communities.

Also, many of the women are illiterate or only semi-literate, and now when so many children are attending school the women increasingly feel their own lack of education.

Women's Clubs give them scope for activities which have a definite adult educational value, and also bring the women into more direct and frequent contact with Administration Officers through participation in club work.

Women's Clubs have another advantage in that membership usually includes all the women of a village, so that in their activities the normally conservative older women and the younger members who more actively desire change, work in harmony and thus achieve a balance between what could be ultra-conservatism and over-enthusiasm. This also ensures that in matters affecting community life as a whole, the women can present an opinion representing the views of all the women of the village.

The clubs develop latent leadership qualities, and are helping women to prepare themselves for partnership with the men in assuming the wider citizenship responsibilities which are developing for the native people.

In many districts the men of the villages have enthusiastically supported the formation of Women's Clubs and in some cases initiated the original request for help in establishing a club.

In some areas, however, the men at first were opposed to clubs, but changed their attitude to one of keen support when they found that club activities were improving the standard of their homes and general village life.

There is a continuing constant demand for the formation of additional Women's Clubs, and Welfare Officers are concentrating on the training of club leaders to meet the need for local leadership and trained personnel in the various districts.

Niue Housing Scheme

(continued from page 36)

to the hurricane, and the amount of materials he can obtain without cost.

On satisfying the Village Housing Committee that he is willing to work in with others who will assist him and whom he is willing to assist, and that he is willing to assist those in his village who are unable to help themselves, his application is endorsed and referred to the Island Assembly for a final decision.

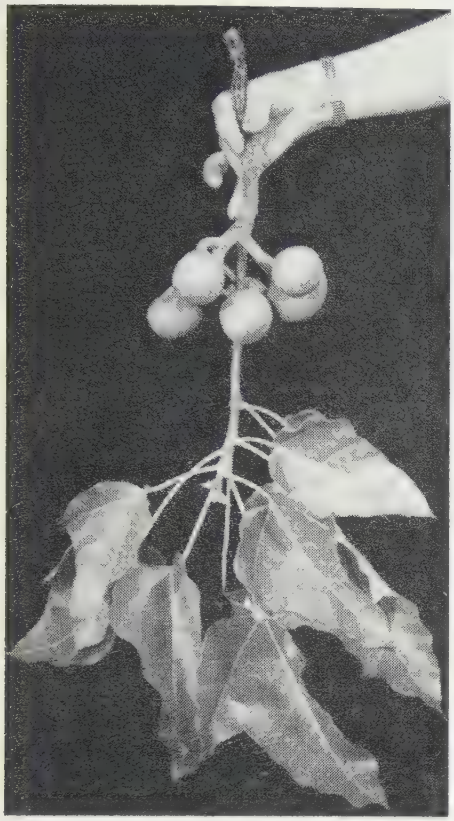
Scheme In Full Operation

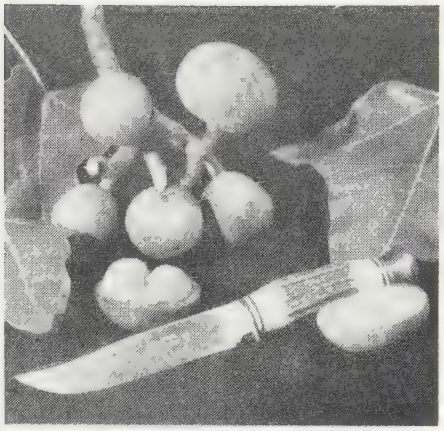
The Niue Island Housing Loans Scheme is now in full operation. The Village Housing Committees are recommending the urgent cases in their villages to the Island Assembly, which has already approved the granting of many loans. Construction of houses has been commenced and the task of rehabilitating the people of Niue is well under way. Although the Scheme has really only been in operation since September, by November, 220 applications for loans had been approved by the Island Assembly.

Two fully-trained New Zealand carpenters are supervising the buildings, and there is already an indication of extreme enthusiasm among the people.

Native Cocoa Plantings Increase In Papua And New Guinea

Plantings of cocoa made by the indigenous people of Papua and New Guinea are increasing steadily. Output has increased from 300 tons in 1954/55 to 1,150 tons in 1958/59. It is estimated that when mature, present plantings will produce between 3,000 and 3,500 tons of cocoa a year.





By JACQUES BARRAU*

Left: Branch of the candlenut tree, which grows to a height of sixty feet, has light-green foliage and a characteristic light-grey bark. Right: The twin nuts are housed in a soft greenish outer covering. Their hard, dark-brown shells contain a soft white kernel, rich in oil.

The Candlenut Tree

IN the riverine and rain forests of the South Pacific high islands, the candlenut tree is a common feature. It is known to the botanist by the name *Aleurites triloba* Forst. (*A. moluccana* (L.) Willd.). Like the cassava and the castor oil plant, it belongs to the family Euphorbiaceae.

Sydney Parkinson, the draughtsman who accompanied Sir Joseph Banks, chief naturalist of Captain Cook's first voyage, described the tree and its uses in Oceania under the name *Telopea perspicua,* which can be found in synonymy in some florae of the South Sea islands, for instance, in Seeman's FLORA VITIENSE.

The candlenut tree reaches sixty feet in height, and its trunk has a characteristic light-grey bark. Its light-green foliage looks frosted, due to a white pubescence on the leaves. The tree thus stands out in contrast with the darker leafage of the forest.

The coarse wood of *Aleurites triloba* has no value, as it decays very quickly. As a matter of fact, rotten logs of the candlenut tree are a favourite breeding place for a number of beetles. Their grubs are much sought after by the islanders, as, for instance, in New Caledonia, where they are considered a delicacy.

In spite of the poor quality of the timber, however, it is used occasionally in the Austral Islands for making canoes.

The most valuable product of the tree is the kernel, which is rich in a drying oil. Although slightly toxic, this kernel nevertheless can be eaten roasted, and has a very pleasant taste. It is advisable, however, to eat it only in small quantities.

In ancient Oceania the main use of these kernels was for making torches. For this purpose they are strung on the midribs of coconut leaflets or on sticks—split bamboo, for instance—and then used as candles. This explains some of the European names for this *Aleurites*: "Candlenut tree", "Candlenut oil tree", "candleberry tree", etc. Oil extracted from the kernel was also used in stone lamps.

The tree had many other uses, which are summarized in the table below.

So important was this tree to the Polynesians that, in his FLORA OF THE HAWAIIAN ISLANDS (Heidelberg, 1888), Wilhem Hillebrand stated that in the domestic economy of those ancient days the *Aleurites triloba* could be considered "as next in importance to the coconut."

Origin In Indo-Malaysia

The species seems to have its origin in Indo-Malaysia, and it is quite possible that the human migrations which populated the Pacific islands are responsible for its wide distribution in Oceania.

The vernacular names of *Aleurites triloba* are similar in a great part of Oceania. Thus in Polynesia it is known as AMA in the Marquesas, LAMA in Samoa, TUTUI in Tahiti, the Cook and the Austral islands, KUKUI in Hawaii, TUITUI in Niue, and in Fiji, where the tree is also known as TOTO, SIKECI, QEREQERE and LAUCI. In New Caledonia, the

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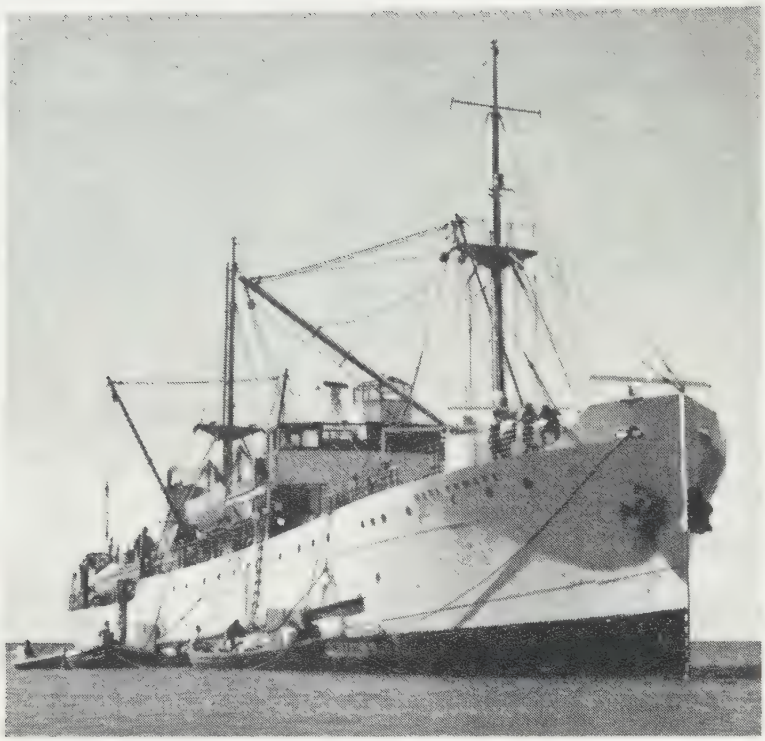
PREPARATION	MADE FROM
Black and reddish-brown dyes used for tattooing and for "tapa" decoration.	Soot obtained from slowly-burned kernel—dye prepared from the juice of the fruit or from juice from the inner bark of the tree.
Waterproof varnish for "tapa."	The gum of the bark.
Quicklime for bird-catching.	The gum of the bark.
Tannin for mats, fishing lines and nets, "tapa" tanning.	The astringent juice of the inner bark of the tree.
Ornaments (necklaces).	Shells of the nuts, sometimes carved.
Medicinal drugs.	The juice of pounded green fruits, leaf sap, juice from the inner bark of the tree, oil from the kernels.
Cosmetics (hair-oil and unguents).	Kernel oil



Exports from the Cook Islands are collected by the steamer "Maui Pomare" from New Zealand. She calls at Rarotonga each month except during the hurricane season from mid-December to the end of March, when all shipping services in the Group cease.

Co-operatives Are Thriving In The Cook Islands

The co-operative movement in the Cook Islands has made remarkable progress since it was launched there in 1955. Today there are over thirty registered co-operative societies throughout the Group.

By DAVID MURRAY*

THE Cook Islands Group comprises fifteen small islands spread over 850,000 square miles of ocean. The total land area is only 90 square miles.

The population of the Group is approximately 17,000.

Rarotonga, headquarters of the Administration, is the largest island, with an area of 16,000 acres and a population of over 7,000.

The islands depend upon an agricultural economy, producing copra, citrus fruits, bananas, tomatoes, pearl shell and similar products. All citrus and banana exports are handled by a government-sponsored scheme, while other products are marketed through local trading stores.

Sea transport between the islands is poor, as there are only three ships trading in the Group, with no regular routes. A steamer from New Zealand calls each month at Rarotonga to take away all exports from the islands. Other ships call at irregular intervals. All shipping services cease during the hurricane season, which lasts from mid-December to the end of March. A fortnightly plane calls at Aitutaki.

Financially the islands are not self-supporting, and the budget has to be balanced annually by a large subsidy from New Zealand.

Co-operation Inaugurated In 1955

Co-operation as we understand it started in the Cook Islands in 1955 following the appointment of a qualified registrar. Before then two organizations designated as "co-operative" had failed because of lack of knowledge, business experience, supervision and co-operative legislation. This left the people frustrated, disillusioned, and in some cases impoverished. When the new form of co-operation was suggested, it was only natural that the history of past co-operatives would be recalled.

After the Registrar had been appointed he made a survey of local conditions. His first annual report stated that he "found widespread indebtedness, over-much poverty, bad housing, some waste of agricultural resources (especially in the copra industry), lack of short-term agricultural credit, a system of land tenure militating against efficient land utilization and initiative in agriculture, little understanding of the use and value of money in a modern economy, and advanced disintegration of community and village culture".

The indebtedness of the people was not to money lenders, but to the trading

* Social Development Department, Cook Islands Administration.

The Atiu Co-operative Marketing Society's store shed and copra-drying barbecue nearing completion. Members built both.

Last November the fourth Annual Co-operative Rally was held on Atiu Island. This photograph shows the Registrar of Co-operative Societies and his staff, with representatives from all the registered co-operative societies in the Group.

stores for goods. Debts were usually repaid from produce exported.

The many weaknesses mentioned in the report applied to all villages in Rarotonga, and indicated that the Registrar should concentrate on societies of the village type, supplying education in elementary principles and practice of co-operation.

Beginning Made In Rarotonga

The Registrar decided to start co-operatives in Rarotonga, subject to public support. A five-year plan of development was prepared, rules and model by-laws drawn up, pamphlets issued to the public, accounting books obtained and the necessary forms designed and printed.

A small booklet, *Co-operation for the Maoris of the Cook Islands,* was written to show how co-operation had developed, and how the principles should be applied and practised. Four co-operative officer trainees were appointed in the first year, and were given training by the Registrar.

A type of society was designed to meet the needs of the people. It was explained to three villages at the request of their inhabitants. In each case the type of society recommended was accepted and registered in due course. Objectives were:

(a) thrift by accepting small monthly deposits from members for a specified number of years;
(b) credit to members for productive purposes; and
(c) purchasing goods in bulk for resale to members for cash.

Objectives were established progressively as each society developed and members obtained a better understanding of the meaning of co-operation.

Credit is given on the personal security of the member and two sureties. During three years no losses have been incurred through bad debts.

These societies have proved that Cook Islanders can save money, provided the organization is available. A Post Office Savings Bank does exist in the territory, but it is not used to the fullest extent because of the small amounts deposited. Also, usually there is a Post Office only in the main village of each island.

The retail business has shown that islanders can pay cash for a great amount of their goods.

In 1955 a thrift and loan society was established for public servants. Initially membership was restricted to Rarotonga but it has now been extended to four islands, and in due course will be open to public servants on all islands in the Group.

Thrift and credit societies have also proved to be a valuable training ground for co-operative officers, and their members are able to receive considerable education in co-operation before larger and more complicated societies are formed.

Co-operation Taught In Schools

The Administration believes that the teaching of elementary principles of co-operation to school teachers is a prerequisite to sound development. Co-operation is therefore taught at the Teachers' Training College, and to pupils in the three highest grades in primary schools.

School savings societies were proposed and accepted by three schools in Rarotonga.

Close contact has always been maintained between the Department of Education and the Registrar's Office.

By the end of 1955, three thrift and credit societies and one thrift and loan society had been registered. Four school societies had also been formed. The total membership of all organizations was 656, and savings amounted to £314.

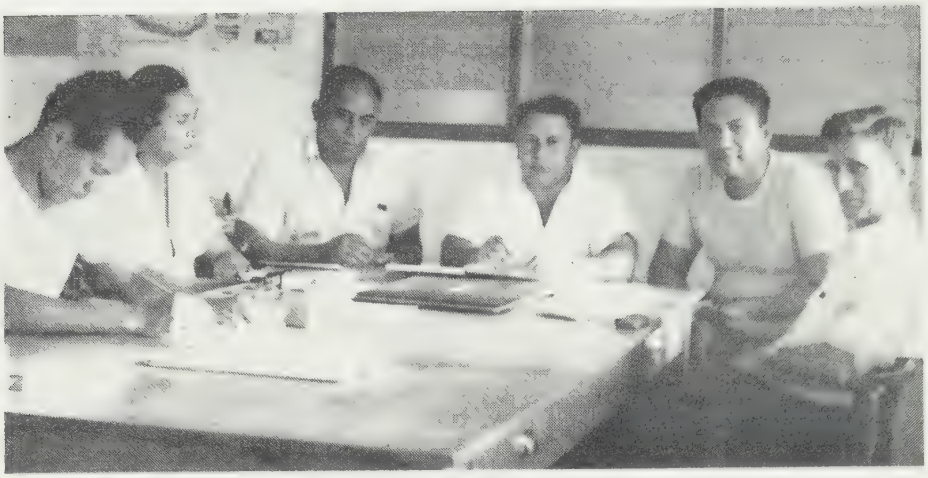
Progress During 1956

During 1956 the Registrar visited Atiu and explained the principles of co-operation to the villagers and teachers. He returned to Rarotonga leaving the people to consider what had been explained.

Later in the year the Registrar was called back to Atiu, where the people had agreed to accept co-operation. Savings societies were formed in five villages, and two school savings societies were formed.

Because of faulty co-operative legislation, persons under the age of 18 could not save money in a registered society. To overcome this a youths' savings club was formed on the initiative of the school headmaster to provide a savings organization for persons who had left school but who were not eligible to deposit money in a registered society.

Half-coconuts drying in the open before final processing in one of the two kilns operated by the Atiu Co-operative Marketing Society.



The Committee of the Cook Islands Co-operative Union holding a meeting in the Social Development Department's office at Rarotonga.

At the end of 1956 a conference was held of representatives from each co-operative society. The purpose of the meeting was to discuss problems facing societies and to make plans for future development.

The following year saw the introduction of co-operation to Mangaia, where savings societies are now established in the villages and schools.

The savings societies at Atiu were formed into thrift and credit societies, and part of the members' savings was used as capital for a marketing society. Its members signed an agreement to sell all their produce to this society.

In Rarotonga, the thrift and loan society had embarked on a scheme to improve the housing conditions of members, and sought financial assistance from the Government to carry out the project.

A monthly newsletter is prepared by the Co-operative Office giving news of activities in various societies, and explaining particular aspects of co-operation.

A co-operative rally has been held at the end of each year. The 1957 rally was coupled with a short instruction course for secretaries and other committee members who wished to attend. Instruction was given in book-keeping, writing of minutes, and general secretarial work.

Training Course In 1958

Early in 1958 a special training course was commenced for co-operative officers. It was prepared with the assistance of the South Pacific Commission's Co-operatives Officer, and covered numerous subjects (20 in all) including book-keeping, auditing, co-operative law, economics procedure at meetings, general co-operation, co-operative education, etc This course continues.

One hour a day is allocated four days a week to the staff training programme, which is already proving worth while. It is essential that co-operative officers possess a sound knowledge of their profession, because they are usually left on an island on their own for several months without being able to contact head office, except by telegram.

In 1958 the first co-operative store was established in Rarotonga. Share capital which was transferred from members' savings in a thrift and credit society stands at only £150. Unless members are willing to contribute more capital, expansion will be very slow.

In 1958 a co-operative bank was formed. Called the Cook Islands Co-operative Union, it centralizes some of the funds which have been accumulated by the thrift and credit societies. These funds are available for lending to member societies. Establishment costs for the first year or so will be high, and arrangements are being made for Government grants for the first three years After that time the co-operative bank should be able to meet all running costs. In time it will serve the whole of the Cook Islands.

Present indications are that each island will have one marketing society, with thrift and credit societies based in the villages.

Committees of thrift and credit societies usually meet each week to discuss the society's business. General meetings are held monthly, and this has been a great help in getting members to participate in the society's activities. It is hoped that regular attendance at meetings will be a large step towards educating the members to understand the real meaning of co-operation. Regular meetings, democratically controlled, should eventually bring forward leaders and help to make the people more self-reliant and confident.

The Administration assists in this territory by providing supervisory staff, and exemptions from stamp duty, income tax and trading licences as well as free registration. The Administration also meets the cost of bringing persons from outer islands to Rarotonga for co-operative rallies and training courses.

Development To July 1959

The following statistics give the state of development to July 1959:

25 THRIFT AND CREDIT VILLAGE SOCIETIES—membership 1052.
1 THRIFT AND LOAN SOCIETY for salaried workers—membership 250.
1 CENTRAL FINANCE SOCIETY—the Co-operative Union—with 26 members.
1 CONSUMER SOCIETY—80 members.
2 PROCESSING AND MARKETING SOCIETIES—307 members.
11 SCHOOL CO-OPERATIVE SAVINGS SOCIETIES—1400 members.
1 YOUTH CLUB SAVINGS SOCIETY—34 members.

The Candlenut Tree

(continued from page 39)

candlenut oil tree is known as GEM, GUM, JEM, MAIDU, RHAWA, TAI and VETE, while in the New Hebrides it is called NAPA or NEPA.

To the genus *Aleurites* belong three other species, cultivated for their oily kernels which produce drying oil. These are *A. cordata* Steud., the Japanese tung oil tree; *A. fordil* Hemsl., the tung oil tree of China; and *Aleurites montana* Willd., the abrasin oil tree of Vietnam.

All these species have been introduced into the South Pacific area. Two of them. *A. fordii* and *A. montana*, could well be grown in some territories.

There has been occasional export of the oil of *Aleurites triloba* from South Pacific territories. This drying oil has some possible industrial uses for paints and varnishes, as well as for wood preservatives, including those which provide protection against marine borers. However, the kernel is housed in a very hard shell which makes extraction of the oil difficult.

As early as 1862 trials were made in New Caledonia for the production of candlenut oil. At that time, with a light press, the yield was approximately 40% oil.

PICTURE CREDITS

Acknowledgement is made for illustrations reproduced in this issue as follows: Front cover photo, p. 27, Australian Official; 22, 23, 24, D. R. A. Eden and B.S.I.P. Department of Agriculture; 28-31, 48, 49 (left), 50, Fiji Official; 34, 35, 40-42, New Zealand Official; 44 (top), Louis Devambez; 44 (bottom), 45, R. L. Catala; 47, black and white drawings prepared by the French Institute of Oceania from water-colour sketches by the author.

An informal chat about women's interests during the fourth South Pacific Conference, held at Rabaul in April-May of last year. Left to right: Miss Lois Niall, a welfare officer of the Department of Native Affairs, Papua and New Guinea; Miss Tiresa Hunter, a Western Samoa delegate to the Conference; and Miss Marjorie Stewart, SPC women's interests officer.

Women's Interests In The Pacific

The rural pattern of women's work in the three territories in which the Commission's women's interests officer has worked to date—Papua and New Guinea, Fiji and the Cook Islands—is briefly described by her in the following article.

By MARJORIE STEWART

Can she bake and can she sew,
Billy boy, Billy boy?

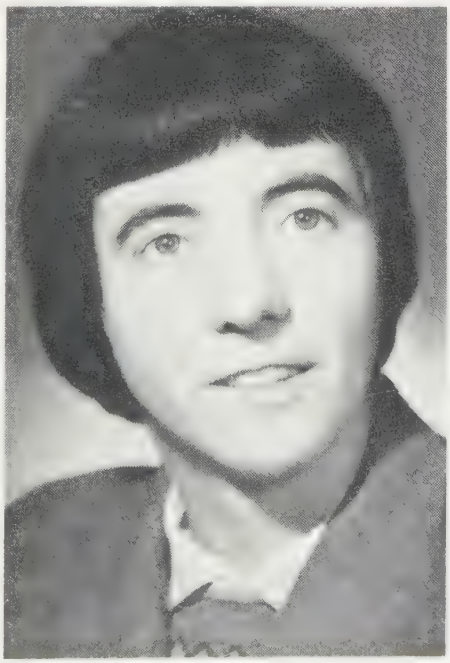
—so runs the song with the old traditional and essential question concerning the wife-to-be: will the house run smoothly, will the food be eatable, will the children go neatly clad, will the daily environment of this marriage succour its success?

The Pacific village woman knows well her own pot and fireside, but as her husband widens his horizon of experience and perhaps increases his income, a higher level of catering and homecraft is demanded, the woman senses a change in the standard of a nearby neighbour, and a new conception emerges of hearth and home.

In some areas the housewife hears a rumour of a novelty called a "Women's Club"—or its vernacular equivalent—and hastens along with her friends to investigate what this weekly meeting has to offer. The unsuspecting husband may rock under the impact of the resultant peanut stew or tomato jam, but once the first shock to his conservative stomach is sustained he may successfully assimilate the new flavours and shapes, and even eagerly anticipate the next culinary intrusion of the club.

The first essential for a women's club is a programme of relevant and acceptable instruction in subjects related to the daily life of the home, no matter at what level of simplicity or sophistication.

But a women's club, or any form of women's advancement, consists in an education and experience beyond the mere homecraft or health or child-care class, essential as these are. A person may attend a course of ten cooking or sewing lessons, profit greatly, enjoy it quietly and exercise her new knowledge adequately, but she may have no increased perception of her privileges and responsibilities in the home and in the neighbourhood.



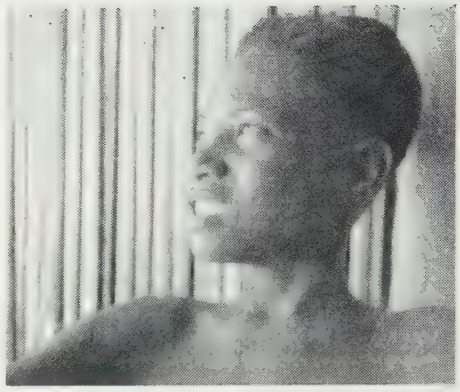
Miss Mary Hopkirk, who arrived in the Cook Islands last October to join the Social Development Department of the Administration. In continuing Miss Stewart's work on Aitutaki, Miss Hopkirk will concentrate on the training of young women and girls in leadership.

Through the club she experiences an expansion of awareness—emotionally, intellectually and as a member of her community. To inspire local club leaders and helpers with a vision of this function is one aspect of the work known as "Women's Interests".

Short leadership training courses for women's work have been initiated in Fiji, Papua and New Guinea, and Aitutaki in the Cook Islands; in the two former territories under the auspices respectively of the Pan-Pacific and S.E. Asia Women's Association and the women's work officers of the Administration. Women leaders from the villages and European helpers were gathered in different areas for a four- to five-day course.

The programme covered, firstly, a flannelgraph portrayal with lively discussion on the place, responsibility and potential of the woman in her home, her community and her country. There followed sessions on club organisation, emphasizing method and programme content as well as the training of office-bearers, the use of local trained personnel in carrying through a club project based on homecraft, health, nutrition or child care; the preparation and use of teaching

(continued on page 46)



Left: Making ready the canoe which the author used in his investigations. Centre: Shells gathered in Onotoa Lagoon included pearl oyster, spider, conch and giant clam. (Tape measure is extended 1′, case is 2″ long.) Later, more promising quantities of pearl shell were found at Abaiang. Right: This young Gilbertese Islander was the author's self-appointed assistant during his visit to Onotoa. He supplied the local names of shells gathered on the outer reef.

Visit To The Gilberts

The Commission's assistant fisheries officer recently visited the Gilbert Islands to study and recommend ways of improving fisheries there. In this article he gives some personal impressions gained during his nine-week stay in the Group.

By LOUIS DEVAMBEZ

TO the many people living in the South Pacific the name of the Gilbert Islands does not often evoke a clear image. For the few who know this group of atolls and reef islands, it usually summons visions of green coconut palms and blinding white beaches against a deep blue sea.

There is, however, more to the Gilberts than these perfect South Sea pictures. Over thirty thousand people live on the sixteen islands, and perforce have to wrest a living from the land and ocean. The average population density is over 240 persons per square mile.

There are two ways of reaching these little dots of coral scattered over six degrees of latitude and straddling the Equator. The ships of the British Phosphate Commission sail from Australia or New Zealand to Ocean Island, where small ships from the Gilbert and Ellice Islands Colony call fairly often for stores and mail. Alternatively, each of the Colony ships and two missionary vessels sail to Suva once a year for refitting, and visitors can usually take passage with them.

Visits by aircraft to the Group are few and irregular.

Coconut The Mainstay Of Life

The coconut tree, first noticed for its beauty by the stranger visiting the Gilberts, is the mainstay of life there. Not only the nuts, but all parts of the trunk and leaves are effectively used to make all kinds of useful things, from houses to toddy cups and from string and rope to copra.

Left: This huge fish trap on the ocean side of Tarawa Atoll is built of coral blocks. At certain phases of the moon large numbers of ikari (Albula vulpes) are taken in it. Right: Fish ponds on Beru Atoll.

Left: Making an eel trap. The dipnet lying against the wall is for catching flying fish. Right: Outrigger lashings of coir, made from coconut fibre. Everywhere coir replaces nails and screws.

Every morning and evening a man from each family goes to collect the toddy, the sap of the coconut palm, which has been slowly dripping from an inflorescence carefully tied and cut.

String and cord made from the fibres of the coconut husks tie every beam and rafter in the houses. One could wander all day in a Gilbertese village noting down instances of the coconut tree's usefulness and still find at nightfall the list far from complete.

Copra The Only Cash Crop

Copra is, of course, produced in all the islands. Collected by small ships, it is taken to Tarawa for export to England. It is the only cash crop, and practically the only export product of the Gilberts.

Various other trees and plants are cultivated with great care by the islanders; breadfruit and pandanus play an important part in their diet.

Babai, a plant akin to the taro, is grown mostly in the northern islands, where a more abundant rainfall produces favourable conditions. However, babai takes from three to seven years to mature, depending on the variety grown, and it is grown more for purposes of prestige than as a regular article of food.

Missionaries and members of the Administration have often tried to grow European vegetables, and to a certain extent they have succeeded. Of course the difficulties are great, since there is very little soil on these islands.

One particular garden on Tarawa is worth mentioning: a few tomato plants of very healthy appearance yield a fair crop, thanks to very careful treatment and the use of hydroponics.

Sea A Main Source Of Food

The sea is a great source of food and all members of each family—except the very old and the very young—take part in some kind of fishing activity. Women often fish with gillnets in the shallower

These tomatoes are being grown hydroponically on Tarawa Atoll by the Co-operatives Officer, Mr. H. R. Cooper.

Left: An excellent catch of ikari taken in a fish trap. Right: The author suggests that ponds such as this could well be stocked with tilapia or similar species.

parts of the lagoons, and the outer reef table is their undisputed shellfish ground.

Men usually prefer to go underwater spearfishing, or even to sail their canoes outside the lagoon and troll for tuna and bonito, or drift fish for castor oil fish at night. Night fishing for flying fish is very spectacular, with each canoe illuminated by a torch made of woven coconut fronds.

Alone among the sixteen islands, Tarawa has a substantial European population and a labour force of several hundred Gilbertese engaged on various construction projects. Obviously they cannot carry on their normal activities as they would in their home islands, and there are a few fishermen who sell their catches to the population. However, they are rarely able to produce enough to satisfy everybody.

Shells For Collection

Anyone who has observed the keen shell collectors who comb beaches, reefs, and rocky shores in other territories cannot help exclaiming when the strictly utilitarian Gilbertese neglect beautiful mitre and auger shells and brilliantly-coloured cowries. Certainly some are exported to the United States, but only in very small quantities. More could probably be sent to Fiji and Australia.

Fishponds Could Be Stocked With Tilapia

In many islands, fish culture played a fairly important part in the past. Nowadays the fishponds are often in a state of disrepair. Those that are still in good condition are seldom stocked regularly with the traditional milkfish.

A number of natural brackish and freshwater ponds would certainly be excellent for stocking with tilapia or some other equally hardy species. Other former fishponds, built on flat ground at—or very near—sea level could with very little modification easily be used as salt pans.

Outboard Motors Needed

One striking aspect of these islands is the absence of mechanisation outside of Tarawa. The splendid outrigger canoes, which are built of innumerable pieces of planking skilfully sewn together with coconut fibre string, are exclusively propelled by sail or paddle. No doubt with a fair wind these graceful craft can reach a speed of seven, eight or even ten knots, but there are also days when hours are spent whistling for a breeze, or in endless tacking to gain a few hundred yards on each leg.

Small outboards would in many cases make the difference between an unproductive day and a profitable one.

Isolation And Friendliness

Conflicting thoughts that often share the mind of the traveller leaving these islands are of their isolation and comparative lack of cash resources apart from copra, and the friendly smiles of the islanders. Many do not speak English, but one does not have to speak Gilbertese to catch the meaning of their traditional greeting, *Ko na mauri*, accompanied by a wide grin.

Women's Interests In The Pacific

(continued from page 43)

media; the place of handwork with a demonstration of at least one technique; and recreational activities.

Handbooks For Leaders

In Papua and New Guinea the training was based on a series of leaders' handbooks which are being produced at regular intervals by the women's work officers and are available in the vernacular. In Fiji and Aitutaki a handbook for leaders was produced to follow up the training course.

In Aitutaki, leadership training took place weekly at three island centres, after which a series of cooking classes was conducted in the villages by the South Pacific Health Service as a demonstration of a possible club activity. Some time later the leaders met together for a four-day intensive revision and extension of their knowledge of procedure.

The new Women's Work Officer, Miss Mary Hopkirk, arrived in the Cook Islands from New Zealand in October last to join the Social Development Department of the Administration. A regular club programme including instruction in sewing and cooking is being initiated under the leadership of the trained office-bearers, while further training of sewing and cooking leaders can proceed forthwith.

Clubs have for some years been developing in Papua and New Guinea. Clubs in Fiji exist to a certain extent under local auspices, but are in need of refresher courses in programme content and methods of organization. Activities in the whole area for girls of post-school age are being slowly developed.

Such is a brief summary of the rural picture in three territories where the South Pacific Commission has had a link with women's work.

Objective Of Voluntary Training Approach

The objective of the voluntary training approach is to encourage a healthy self-reliance in the women's work programme in isolated districts and islands.

Women leaders are chosen by their own people as office-bearers and instructors. To enable them to function satisfactorily, a short term training is provided as described above, while opportunity is sought to develop the capacity of the sewing, cooking, games and song leaders in their particular subjects, not only increasing their knowledge but helping them with the art of demonstration.

So far in the clubs, practical subjects are taught mainly by a European helper living temporarily in the neighbourhood. However, where possible, she not only teaches the group but also takes pains to select a promising member to train as future leader in that subject. Where Women's Work Officers function in a territory, one of their means of service is to plan for regular leadership training under different categories.

Training Courses Essential

The policy of promoting self-help through local trained leadership points to the necessity of providing ever-increasing opportunities for training courses.

In various countries the Rural Training Centre has proved to be an excellent instrument for achieving village improvement. Women who have undergone a three- or six-month period of training are enabled to return to their villages with enhanced prestige, and to practise in their homes and gardens the principles learnt at the Centre. In addition, they have an obligation to teach through local groups, providing just that practical knowledge which was formerly lacking.

Women's Work Officer To Stimulate Programme

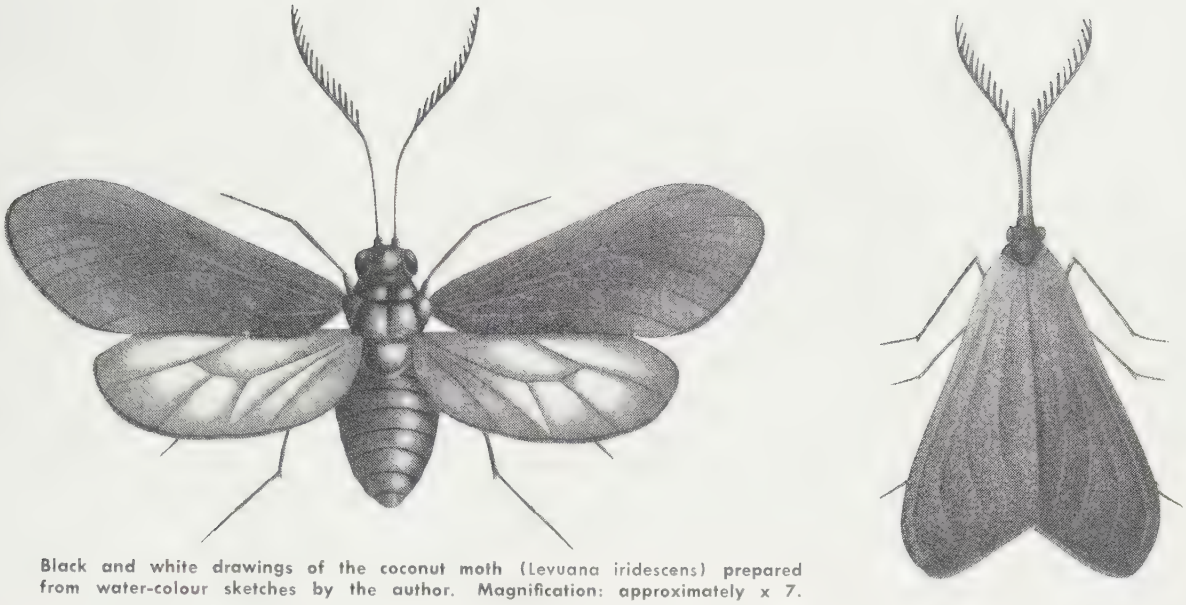
An itinerant Women's Work Officer stimulates the programme, refresher courses in various aspects of leadership are held at regular intervals, a link is made with neighbouring villages, and eventually a movement is established throughout the territory.

Such is a possible development on the rural side of the Pacific Women's Work pattern.

Women's Interests Seminar Proposed For 1961

The present experimental stage may culminate in a women's interests seminar being planned for 1961 by the South Pacific Commission, which has been invited to hold the meeting in Western Samoa.

There, if the seminar eventuates, a group of representatives actively engaged in women's work in the South Pacific area will gather to consider the needs and opportunities of women and the family, both urban and rural, and to formulate a further stage of development in the programme of women's interests.



Black and white drawings of the coconut moth (Levuana iridescens) prepared from water-colour sketches by the author. Magnification: approximately x 7.

Search For A Parasite

In 1919 the Fiji Department of Agriculture assigned to the author in his official capacity as entomologist, the task of searching for a biological control for the coconut moth Levuana iridescens. *A pest that had then been known on the main island of Viti Levu for about forty years, it had made virtually impossible the commercial cultivation of coconuts there. This story of the author's finally-successful search provides an excellent example of how an effective biological control for a major pest can be sought for, and found. The Commission's entomologists are similarly searching in Africa and South-east Asia for a control for the rhinoceros beetle* Oryctes rhinoceros, *which today constitutes a most serious and growing threat to the copra industry in the region.*

By HUBERT W. SIMMONDS*

WHEN I joined the Fijian Department of Agriculture in 1919 as entomologist I found a number of major problems awaiting me in the form of pests and parasites which in one way or another were causing economic losses that in several instances were serious. Most of them have now been brought under close control by biological methods (though unfortunately others have taken their place).

My first overseas assignment for the Department was to Tahiti in connexion with the scale insect *Aspidiotus destructor,* followed by a short trip to the French islands of Wallis and Futuna. It was when returning from this trip and passing the small Fijian islet of Caqulai that I noticed it looked as if the coconut palms had been swept by fire.

On landing I found that the burnt appearance of the palms was due to the attacks of the larvae of the small purple coconut moth, *Levuana iridescens,* a pest hitherto confined to Viti Levu, the main island of Fiji. It had been known there for about forty years, where it had made the cultivation of coconuts commercially impossible. By reaching the islet of Caqulai it created a grave threat to the main copra areas of the Group, and thus its control became my most important objective.

The adult insect is a small purple insect about half an inch across the expanded wings, the body being tawny yellow. Its eggs are laid on the underside of the fronds, in groups of about forty. There the creamy, bristly larvae feed openly in long straight lines, destroying the tissue but never breaking through to the upper surface or feeding along the edges.

The damaged leaf then takes on the greyish, burnt appearance described above, apparent from a considerable distance. The flat white cocoon is generally placed at the base of the leaf.

Although not known from any other part of the world, all the evidence suggested that it was an introduction from overseas. But in the absence of any known close relative, there was nothing to indicate whence it might have come. The evidence that it was an importation was:

(i) Although feeding openly, it had no specialized enemies in Fiji, and few predators attacked it.

(ii) There was a tradition that coconuts formerly yielded well on Viti Levu, and that the trouble was due to a curse laid on the island by an old Chief.

(iii) When first recorded by Europeans it seems to have been confined to the islets of Viwa and Bau, and the coast just opposite.

(iv) Elsewhere, tradition always recorded it as appearing after some hurricane.

(v) The early records dated to the days of the sandalwood traders, who used these islets as their bases.

From Caqulai the pest quickly spread to Ovalau, from the port of which—Levuka—most of the communication with the coconut-growing areas of the Group was maintained

* Formerly Government Entomologist, Fiji.

The Yasawas, a chain of islands which lie in the north-west of the Fiji Group, were unsuccessfully searched by the author for possible clues to the original home of the coconut moth. In the foreground is Navitu Island.

Although no near relative of the pest was known, Knowles, then Director of Agriculture, had ascertained that in Malaya and Java there was a distant relative with similar habits, known to be subject to parasitic attacks. However, the general opinion of the specialists whom I consulted was to the effect that, while some of these parasites would probably attack our insect, there was no certainty that any would. They felt further that with the great distances involved and the absence of air transport in those days, the expense of trying to introduce any would not be justified until a careful search had been made to try to find the original home of our insect, when we would be sure that any enemies we found attacking it there would do so if successfully transported to the new environment.

Thus guided, my first move was to try to find evidence that our pest really was an importation and, if so, whether it had come naturally from some nearby country or whether it had gained entrance by human agency, in which case it would probably have a more distant origin.

If it had been a natural immigrant it could have come only from the north-west. Thus I decided to explore the chain of islands lying in that direction off the coast of the two main islands and known as the Yasawas, since if it was a natural immigrant, it could hardly have failed to have first established itself on one or more of these. Accordingly, an Inspector from the Department and I took a cutter and cruised from island to island, discussing the position with the local inhabitants.

We found no trace of our pest on any of these islands. However, there was another larger one—Malolo Island—lying well away to the south of the Group, and I decided to visit this also. As we approached it, about half a mile off shore, we were met by a swarm of flies. Upon landing, we found them present in appalling numbers. We also found our pest, well established. However, enquiries showed that it had come from the mainland and was not an immigrant from outside Fiji, having been there only about five years, and that it had first colonized a small islet lying between Malolo and Viti Levu.

This completed our tour of the Yasawas, and we turned towards the mainland.

*

As a result of this tour I was satisfied that *Levuana iridescens* had reached Fiji by human agency shortly prior to 1860, and that it had probably been brought in by one of the sandalwood boats which were in the habit of calling at Bau, in which neighbourhood it had first appeared.*

It was therefore decided that I should make a tour of the coconut districts of New Guinea, the Bismarcks, Solomons and New Hebrides, to try and discover whether it had come from any of these groups or whether any closely-allied species from which we might obtain parasites was present in any of them. At that time it was thought that it would be upon some species of palm that it would be found. However, the discovery by a colleague of a very closely-allied larva feeding upon a series of *Alpinia*, in the Solomons, suggested that it would be upon some other monocotyledonous plant than a palm that it would eventually be found. Unfortunately, my colleague's larva died, so that it could not be identified.

* Although the original home of this insect is still unknown, further evidence which has come to light since those days strongly confirms this assumption, and adds a probability that this original home will prove to be in or near the Banks or Santa Cruz Groups.

New Guinea And The Bismarcks

It was arranged that I should first visit the Bismarcks and New Guinea, and thence work my way back through the Solomons and New Hebrides, which meant travelling by ship from Sydney.

On reaching Rabaul I was most hospitably received by Captain Jolly, the Chairman of the Expropriated Estates Board, who arranged that I should make my first headquarters at Kokopo, a few miles along the coast, and centre of an important coconut area. However, I found that the trees there were mostly too tall for my purpose, and it became necessary to move elsewhere.

Insect life, however, was most abundant, and where I could get to the flower spikes of the palms there was a vast array of life, including bright green cetonid beetles, several kinds of stag beetles, and two or three big dynastids. In addition, the pentatomid bug, *Axiagastus cambelli*, swarmed over every spathe, where it must have done damage. Masses of small bees and flies hovered about the blossoms.

Since that time I have seen coconuts in most portions of the tropical world, but never have I seen anything approaching the swarm of insect life that was present in these New Guinea palms.

From Kokopo I went on to Ralauwat on the north coast, where it had been arranged that a schooner would pick me up and take me to Madang on the mainland of New Guinea, and thus give me an opportunity of visiting a number of plantations at which the ship called on the way.

The little schooner on which I travelled from Ralauwat had had a decidedly hectic career. Originally built in Japan for use as a pirate, she had run ashore on one of the islands and been abandoned. An Australian syndicate refloated her and sold her to the Germans, but, having been recaptured in the war, she again flew the Australian flag. When I travelled on her, she was being used by the Board managing the ex-German estates, but was nearing the end of her days. Just after I left her she was finally wrecked.

My own experiences on her were the reverse of pleasant, and on several days I wondered whether we would ever reach land again. Just after leaving Ralauwat we ran into a strong gale, which continued for practically the whole of the voyage. With the heavy seas no fire was possible, and we were reduced to dry biscuits until we arrived at the island of Witu, some forty-eight hours later.

We spent three days on this island, waiting for the weather to moderate. During this enforced stay I received most

Above: Narou village, on Navitu Island. This is one of the many villages in the Yasawas that the author visited early in his investigations. Right: The topsail schooner "Vunatali", on which the author travelled from New Britain to the New Guinea mainland, had had a colourful history. Built in Japan, she was wrecked in the islands, refloated by an Australian syndicate, sold to the Germans, and later recaptured from them during World War I, when she again flew the Australian flag. Soon after the author left her she was again wrecked, becoming a total loss.

lavish hospitality from the manager of the estate there, and in his company made a crossing of the island, or at least of that portion of the half circle on which the plantation is situated.

During the expedition I found plenty of interest, including a new foliage-destroying beetle attacking the palms which now bears my name. Living with it—and almost certainly preying upon it—was an exceedingly flattened earwig.

The green tree-ant, *Oecophylla smaragdina*, swarmed upon every palm. The habit which these interesting insects have of using their larvae as living shuttles, while well known to entomologists, is probably not so familiar to the layman. As their name suggests, they make their nests in trees. To do this a number of them will take two leaves and hold their edges together, while another will take one of their larvae in its mouth and with it touch the edge of one leaf. The larva immediately attaches a strand of silk to it, when the ant moves over to the other leaf and repeats the process, continuing to do this until the two edges are firmly held together.

This ant is found throughout most of the old-world tropics. It has an unpleasant bite and adds insult to injury by turning round and injecting formic acid on to the wound. It has a bad reputation as a protector of certain scale insects, some of which can generally be found in its nests, where also several other insect guests are to be found including the larvae of a large lycaenid butterfly, *Lyphya brassolis*. This, however, is probably an unwanted guest, as it is supposed to feed upon the ant's young.

On the whole, it is probably a beneficial species as far as mankind is concerned, in that it destroys a great number of noxious insects, I have seen these ants dissect a large living locustid limb by limb, and eventually carry the heavy body away. I have also seen them treat a beetle the same way.

In the Solomon Islands the increase of a certain pest, which led to a heavy fall of immature coconuts, has been definitely shown to have been brought about by a local falling-off in the numbers of this ant, which had previously held this pest in control. Curiously, the trouble, as has so often been the case, was a man-made one, being largely due to the removal of the undergrowth in the plantations. The ants were thus forced to come to the ground when moving from one tree to another, and while doing so they were vulnerable to attack by enemies and suffered severe losses.

After waiting three and a half days at Witu the Captain decided to cross to the north coast of New Britain, although the weather was worse rather than better.

In due course we arrived at Talasea, which is a most lovely spot, set in the midst of intense volcanic activity. There are five large volcanoes comparatively close at hand, three of which are frequently active.

Entomologically there was not a great deal to be noticed. However, I found a leaf-mining beetle allied to a Fijian pest (*Promecotheca reichei*) attacking coconuts. It in turn was being attacked by a bright red bug. (The Fijian pest, incidentally, is now under close parasitic control.) I was also interested in an asilid fly, itself a predatory species, which so closely resembled a black and yellow wasp that none but an entomologist would have touched it.

The manager of the coconut plantation here had a fine vegetable garden, where he grew excellent tomatoes and cabbages. The latter were grown from cuttings and were of the tall Jersey or walking stick variety. There was also a clear stream, full of water-cress. It all formed a very welcome addition to the tinned food we were getting on the schooner.

For a little way after leaving Talasea we had the wind behind us and the going was very pleasant, but as soon as we rounded Cape Gloucester we ran right into it again and had another buffeting. The Captain decided to put into Rock Island, partly to get fresh water and also to have a quiet night.

The little bay into which we sailed was almost completely landlocked and formed a delightful harbour, whilst a little stream flowing into it provided us with fresh water.

We left early next morning, and with the wind behind us, made a quick and pleasant crossing of Dampier Straits to our destination — Madang, on the north coast of New Guinea. The small settlement here is situated along a narrow coastal plain, with a deep and beautiful harbour on one side and three tiers of high mountains on the other. The plain is planted with coconuts, but in consequence of the high mountains, tends to dip inland, forming a swampy area, difficult to drain.

Having spent a few days examining

A village on Malaita Island in the Solomons Group. It was in a plantation on this island that the author came across a previously unknown thread-blight disease of coconuts which he was afterwards to find not only in the New Hebrides but also in Fiji.

the plantations here I went on to Alexishaven, a few miles along the coast, where there was a large Catholic mission —since, I am informed, destroyed during the war. Unfortunately my stay on this interesting coast was cut short by the early arrival of my steamer, which took me back to Rabaul. Here I found I had only time for one more local expedition before going on to the Solomon Islands; so decided to go to the Baining district on the north coast of New Britain.

I had now visited a considerable number of coconut plantations and sago swamps, and had found much of great interest, including a number of hitherto unrecorded pests and diseases attacking coconuts. However, I had found nothing to indicate that our pest or any near relative was present, at least on palms, either on New Britain or the mainland.

I thus felt that there was nothing to justify my staying further in New Guinea, and decided to join the steamer for the Solomon Islands.

Exploring The Solomons

After a brief call at Kavieng in New Ireland, we crossed to the northern end of Bougainville, the first of the Solomon Islands, and passed on down the coast. It was evening when we reached Kieta, and, as we were leaving early next morning, I did not have much chance to see any of the local plantations.

Our next call was at Faisi, in the Shortland Group, where my attention was called to the attacks of the larva of a very small moth, which bored into the unopened spathes of the coconuts, damaging the flowers and some of the young nuts. I had not come across this insect previously, but subsequently found it to be widespread, but only of minor importance.

After a good look around the coconut plantations here we continued our voyage to Tulagi, then the capital of the British Solomon Islands.

Using Tulagi as headquarters, I was able to visit a number of plantations during the next few weeks. Although I was not very hopeful that I would actually find our pest so far away from Fiji, I did hope that I might find some nearly related species which would yield parasites more certain to attack the Fijian insect than those of the Malayan insect.

From Tulagi I crossed to Messrs. Lever Brothers' plantation at Lunga, on Guadalcanal, a place that was to become very well known in the war. Here I spent a week as the guest of the manager and his wife.

Although Lunga is only a few miles across the straits from Tulagi, its climate is vastly different, being much drier. There are considerable patches of grassland with outcrops of coralline limestone in the place of the rain forest of Tulagi. The new capital of the Group has now been built not far from this plantation.

After leaving Guadalcanal I went on to Su'u, a plantation on Malaita. It was a decidedly wet spot. I came across a previously unknown thread-blight disease of coconuts which, curiously, I was afterwards to find not only in the New Hebrides but also in Fiji.

From Malaita I worked my way from plantation to plantation back to the Morovo Lagoon, Faisi, and finally Tulagi.

Here I was informed that caterpillars were doing a good deal of damage to the foliage of coconuts at a place on the island of Ysabel. Although there was very little time before my steamer was due, this was far too important to be ignored, and Messrs. Lever Brothers most generously lent me a steamer to enable me to visit the plantation. The trip was reminiscent of the voyages of the old explorers, as at that time these waters had not been properly surveyed, the chart showing reefs where none existed and open water where coral heads abounded. We travelled slowly, with a man at the masthead and another on lookout forward.

On arrival I found that whilst the report was correct in so far as the damage was due to the attacks of a caterpillar, it was not our pest but the larva of a skipper butterfly. It was, however, to prove of considerable interest to me later, although I did not at the time realise the significance of what I saw, only noting that certain stages in the life cycle of the caterpillar were missing; in other words, "there was a gap in the sequence of generations", of which I shall have much more to say when dealing with the parasite which finally brought our pest under control.

The visit to Ysabel ended my tour of the Solomon Group. As in New Guinea, I had found nothing to suggest that any near relative of our pest was present upon coconut or other palms there. Apart from the immediate objective of my trip I had, however, been able to record a number of previously unknown pests and diseases attacking the palm, and to make some observations on the agencies tending to hold them in check.

I felt that the time had now come for me to go on to the New Hebrides, where (or in one of the adjacent groups) I am more than ever of the opinion that our insect will some day be discovered. However, the matter is of academic interest only, as our pest is now under close biological control.

(To be concluded)

1959 Record Trade Year For Western Samoa

In 1959 the value of exports from Western Samoa reached an all time high, as did the total volume of trade. While banana and cocoa exports were slightly down on 1958 figures, copra exports soared from 11,000 tons in 1958 to 16,800 tons in 1959, with a value of around 1,400,000. Total tonnage passing through the port of Apia was also a record, increasing from 119,396 tons in 1958 to 124,000 tons in 1959.

Night study at a book-keeping course organized by the Fiji Department of Co-operative Societies. Each course is held in a village selected as being reasonably accessible to the societies that will send trainees.

Training Co-operative Workers In Fiji

As the need arises the Fiji Department of Co-operative Societies organizes book-keeping courses for officers of Fijian co-operative societies. How this is done is described below by . . .

F. E. M. WARNER*

THE first book-keeping courses that were organized by the Fiji Department of Co-operative Societies, for the training of officers of Fijian co-operative societies and unregistered groups, were held at its headquarters in Suva. However, it was soon found that although the capital as the centre of the archipelago's lines of communication was undoubtedly the best point of assembly for trainees, it had few other advantages.

The overcrowded city is chronically short of accommodation for visitors, the cost of living is high, the trainees are unable to live together and the novelty and distractions of urban surroundings keep them all too frequently from their studies. Moreover, classroom space is limited, and courses suffer interruption from the routine activities of the Department.

Courses Shifted To Villages

The courses, therefore, were moved from Suva to Fijian villages reasonably accessible to the societies for whose benefit they are held, yet sufficiently remote from towns to remove all temptation to truancy, where the people are able and willing to support an influx of visitors for five or six weeks and where the general attitude is sympathetic to co-operative development.

In Viti Levu, for instance, a village is found as near as possible to the group of societies whose officers will attend the proposed course. Out on the smaller islands which have not enough societies to support a purely local course, a village is chosen on an island which has the best communications with the neighbouring islands over which societies and unregistered groups are scattered.

As the staff of the Department is limited and the courses take up the full time of senior inspectors for two months, they are not normally held unless at least ten societies or unregistered groups are prepared to participate.

Organization Of Courses

Within the selected villages the trainees live in familiar surroundings, away from external distractions and under a boarding-school discipline that is regulated by the senior instructor and maintained through prefects elected by the trainees.

The villages make available either school buildings during holidays, churches, or large native-style houses for use as classrooms, one or more houses to serve as dormitories and mess rooms, servants to cook and launder, and basic food supplies. Groceries such as soap, bread, butter, jam, tea, flour and kerosene are purchased from the local co-operative stores.

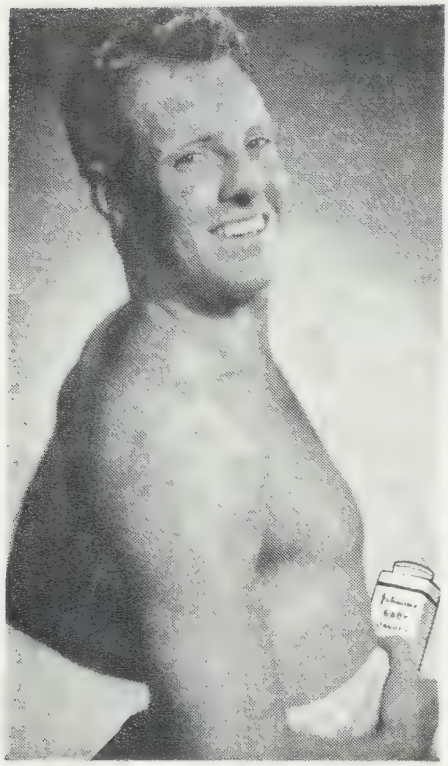
The Department supplies instructors, teaching equipment, text books and stationery.

The trainees organize and meet the cost of their own messing, and the host villages are paid for basic food and services provided at rates that have been agreed in advance.

Costs vary with locality and number of trainees but they are never high and are always within the means of the smallest unregistered group. The highest cost to a trainee has been £3 per week, while under the most favourable conditions it can be as low as £2. Messing and a small outlay for stationery are the only expenses that must be met. No charge is made by the Department for its services.

School buildings provide ideal classrooms for the courses as they are usually the only buildings equipped with desks, tables and chairs: but as they are only available during the long Christmas holidays—a time when adults are no less reluctant to study than children—they can seldom be used. Churches and meeting houses are rarely furnished, and the trainees must either improvise desks out of planks and wooden boxes or even use their suitcases or the floor to write on. Fortunately they are always at ease however they sit.

* Registrar of Co-operative Societies, Fiji.



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Trainees of another book-keeping course, and their classroom, which was the Provincial Bure at Levuka.

The numbers attending courses range between fifteen and forty. Since the educational background of the trainees varies widely, and this variation is reflected in irregularity of progress, the courses must be sufficiently well staffed to provide for much individual tuition. The maximum number of trainees that can be handled by a single instructor is ten, and the courses are staffed on this basis.

The Course Curriculum

Instruction commences with the use of the journal and proceeds by means of carefully-graded lessons, exercises and tests, to the use of the ledger and cash book, and the preparation of trial balances. After the trainees have mastered the general principles of double entry book-keeping they proceed to apply these principles to actual records of co-operative societies.

They finally go on to the preparation of simple trading accounts, profit and loss accounts and balance sheets.

All exercises are corrected personally by the instructors and no trainee is allowed to proceed to a more advanced stage until he has completely mastered the stage preceding it. The intelligence of Fijian trainees is high, and when they have had a reasonable primary education they quickly acquire a working knowledge of simple accounting.

Although they are not required to progress beyond the trial balance stage in order to gain a pass, a high percentage of them are able to prepare full trading accounts at the conclusion of the courses.

In Fiji, where communications are so poor that many secretaries must work unaided for long periods between visits by inspectors, a thorough understanding of the basic principles of book-keeping is essential if their records are to have any value.

Four To Six Weeks' Duration

Trainees are allowed one day in which to settle into their new environment; the courses commence on the second day.

School is held daily except on Sundays and public holidays. Hours of work are from 8.00 or 8.30 a.m. to 4.30 or 5.00 p.m. with an hour's break for lunch. Where facilities for night study exist, evening classes are held from 8.00 to 10.00 or 10.30 p.m. Evenings are also used for lectures and general discussions on co-operative principles and procedures, simple economics and the rules governing general and committee meetings.

Instructors are required to send a weekly return to headquarters showing the daily progress of each trainee, so that the Registrar is in constant touch with the work being done.

The courses usually last from four to six weeks, depending on the good nature of the host villages, the state of food supplies, the progress and interest of the trainees, the availability of transport to carry the trainees back to their homes and, of course, the financial strength of the mess committees. They are closed by examinations and the completed and marked papers are sent to headquarters.

Messing Arrangements

Messing is organised by a committee having the senior instructor as chairman and four or five of the trainees, elected by the rest, as members. Each of the trainees is required to bring £12 to the course and the secretary and treasurer of the committee receive these moneys as soon as the committee has been constituted.

The funds are disbursed at the direction of the committee (which meets at least once weekly) and the chairman is responsible for ensuring that mess-

ing accounts are properly maintained and audited, and that the trainees are kept informed on how their funds have been used. These accounts are sent to headquarters at the end of each course.

Meals are simple but satisfying. Breakfast consists of bread, butter, biscuits, pancakes, jam and tea, coffee or cocoa; lunch of meat or fish with native roots and green vegetables, fruit and tea, coffee or cocoa; while dinner is similar to lunch.

Graduation is usually celebrated by a feast or picnic, and any moneys still remaining in the hands of the committee are used to buy prizes for the winners of the highest marks in the examination, if these have not been donated by the staff of the Department.

Follow-Up Visits By Inspectors

As soon as the trainees have returned home to their societies or unregistered groups, they are visited by inspectors who assist them in opening their books and who remain with them—for several days if necessary—until they are able to carry on by themselves.

These courses, as may be imagined, require much preliminary organization. Societies and unregistered groups have first to be persuaded to support them by sending at least one—preferably two—trainees each, and paying their fares and messing expenses.

When a sufficient muster of trainees has been arranged, a village that is willing to house the course must be found and a suitable date and terms of occupation be negotiated with its elders. The date and terms then require the approval of the societies and unregistered groups.

After that, if the course is held out in the islands, assistance must be provided with transport and arrangements made with the owners of local trading vessels to vary their routine itineraries in order to carry the trainees from and back to their homes. Nevertheless, the effort involved has proved to be well worth while, for in seven years, several hundred officers have been trained.

Replacements Constantly Needed

If all the trainees remained in office, the societies and unregistered groups would be well served, but there is of course a steady loss of trained officers, and new courses must be held from time to time to provide replacements.

Officers leave their posts when they go away from their villages for personal reasons, when they are underpaid or not paid at all by grateful committees, when their work is frustrated by the demands of native custom, or when they simply grow tired of its monotony.

But the gains have been greater than the losses, and comparatively few societies or groups cannot now produce at least a monthly trial balance.

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Commonwealth Trading Bank

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(continued from page 24)

vessel for freighting his copra to Honiara, Yandino or Gizo, but the isolated smallholder must rely on a visit by a trader and accept whatever price is offered for his product. A sign of the developing acumen of the Solomon Islander producer is given by the wish of the Marovo and Choiseul people to establish producer co-operatives in order to cut out the middleman trader. The Co-operative Department has this proposal under examination.

It is not known why the Copra Board has not fixed the price of copra which must be paid by the traders to the growers in any particular district. All the Board does is to advertise at intervals the price it will pay for the first-, second- or third-grade copra delivered to its centres at Honiara, Yandino or Gizo.

In a number of other Pacific territories the Authority fixes different prices for its various districts or zones. Zone prices are computed by adding cost of freight and handling charges to the nearest exporting centre, making an allowance for shrinkage and a reasonable profit for the merchant, and thereby ensuring for the grower a fair price for his copra. The merchant accepts the risk of down-grading or rejection of the product by the Government grading officer at the exporting centre.

As an alternative in the Solomon Islands, additional purchasing-cum-exporting centres could be set up wherever there is a suitable harbour in appropriate districts where copra is heavily produced. Such additional centres would have the effect of shortening the trader's runs—thus lessening the sea haulage costs and risk of shipwreck—and should automatically reduce margins between Board prices and those paid by traders to growers.

Native Groves Overcrowded

New areas are being planted under coconuts by Solomon Islanders, particularly in the New Georgia Group. However, the Department of Agriculture is concerned at the overcrowding of palms on the new plantations. It is equally concerned at the close planting on the old native groves, and the consequent low production from such areas.

On many of the native plantations the palms are not spaced correctly, and it is not uncommon to find mature trees planted short distances apart with scarcely a nut to be found upon them.

It is difficult to persuade the native owners that in order to increase production they must cut down a number of their fully-grown trees. Advice that in such overcrowded areas a reduction in numbers will unquestionably increase the number of nuts from the remaining trees may be agreed to politely, but it is seldom acted upon. They usually smile and say calmly, "By-un-by this fella catch 'im plenty piccaninny".

For its future district work, the Department has arrangements in hand for the supply of seed nuts to growers from an area of proven high yield from which all poor producing palms have been culled.

Demonstration plots are being established to show village people the advantage of using good seed, culling seedlings vigorously, spacing palms properly, and of controlling insect pests.

The Department of Agriculture is to be congratulated upon the results achieved by its scheme for improving the quality of copra by grading. In pre-war years, copra from the Solomons was perhaps the lowest quality in all the Pacific. Today's copra on average is clean, sweet-smelling and generally well dried.

The present scheme was introduced in 1954, and a description of three grades was published for which price differentials would be paid by the Copra Board. At first, a difference of £9 per ton was paid between first and third grades. This was increased to £11 for a short period, and finally reduced to £6; it remained at that level for some years and was reduced to £4 in 1960.

That the differentials have had the effect of improving quality is borne out by the following figures, which give the

proportion of third grade exported from the Solomon Islands over six years: 1954, 93%; 1955, 76%; 1956, 53%; 1957, 46%; 1958, 35%; 1959, 38%.

Insect Pests Retarding Development

The main pest is *Amblypelta cocophaga,* which causes serious loss of crop in certain places through immature nutfall.

Although it has been established that this bug is troublesome only in the absence of either of two ant species, *Oecophylla* and *Anoplolepis,* no really effective control has yet been discovered. Since the bug feeds only upon mature palms, the spraying of heads of coconut palms which may be forty feet in height is unlikely to be an economic exercise. Some badly-infected areas have at times been abandoned.

The coconut beetle *Oryctes rhinoceros* has not so far been reported in the Solomons, but two similar beetles, the Solomon Island rhinoceros beetle *Trichogomphus semmilinki,* and the New Guinea rhinoceros beetle *Scapanes grossepunctatus,* do major damage among seedling palms. Both the latter varieties bore into the growing stem of young palms and cause serious malformations as shown in an illustration. Affected palms are replaced.

The leaf-eating beetle *Brontispa longissima* is widespread, causing damage to young plantations if not controlled by spraying. A 0-15% dieldrin solution gives excellent protection against this pest.

Labour For The Plantations

Generally speaking, sufficient labourers are available for planters in the Solomons. Malaita is the main source of supply, but some districts have a limited supply of young men who seek casual work on nearby estates.

Some of the larger plantations must rely to a great extent upon labourers recruited from Malaita Island, which has the largest population in the Group. Their recruitment, transportation and eventual repatriation expenses are not inconsiderable.

Married men from Malaita are sometimes reluctant to offer their services for longer than six months unless accompanied by their wives. In consequence, married quarters are being provided on most of the plantations to induce workers to stay for longer terms.

Future Of The Industry

Unusually high prices for copra in the past few years have stimulated interest in planting in the Solomons, but the difficulties and costs of transport to exporting centres remain a retarding factor to the development of the industry.

All export arrangements are subject to the approval of the Copra Board. If new capital is to be attracted for opening plantations, or the indigenous inhabitants

(continued on page 60)

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PACIFIC READING

Material in this section is contributed by the South Pacific Commission Literature Bureau. Any enquiries relating thereto should be directed to Box 5254, G.P.O., Sydney, Australia.

Notes and News

Literature Bureau Publications. The following list details some of the publications produced through the South Pacific Commission Literature Bureau, either in association with publishers or by the Bureau itself on behalf of various Pacific territories. The titles listed are those which are currently available or if temporarily out of stock, are likely to be reprinted within a reasonable time; earlier publications which are now out of print and are not likely to be reprinted have been omitted. Orders for books (other than those marked with an asterisk) should be placed through any recognised bookseller; the titles bearing an asterisk are available direct from the Literature Bureau. All prices are quoted in Australian currency. Postage is additional.

In some cases substantial discounts are allowed on orders of 12 or more copies received from training institutions, missions and schools which have no bookseller in their area. Enquiries should be made through the South Pacific Commission Literature Bureau, Box 5254, G.P.O., Sydney, N.S.W., Australia.

SUPPLEMENTARY READERS

Bonito Series (Stories of factual and historical nature with an authentic Pacific background.)

The Hiri. C. Wedgwood. Longmans, Green & Co. 24 pp. Illust. A.1s. 6d.
An account of the old lakatoi trading expeditions made by the Motu people to the Gulf of Papua.

Across New Guinea. Ivan Champion. Longmans, Green & Co. 24 pp. Illust. A.1s. 6d.
The story of the first crossing of New Guinea from the Fly to the Sepik Rivers.

Nauru, the Phosphate Island. G. A. Pittman. Longmans, Green & Co. 24 pp. Illust. A.2s. 0d.
A description of how a phosphate island is formed, the mining of phosphate and how it is used in industry

The Story of Nabetari. E. M. Pateman. Longmans, Green & Co. 24 pp. Illust. A.2s. 0d.
The epic voyage of a young Gilbert Islander who, during World War II, drifted in an open canoe for seven months before reaching safety.

Pacific Heritage Series (Stories of a biographical nature dealing with records of outstanding Pacific Islanders.)

**Heroes from Fiji.* R. S. Adam. Macmillan & Co. 48 pp. Illust. A.3s. 3d.
A collection of stories describing brave deeds by people of Fiji during recent years.

Heroes from Papua and New Guinea. P. Livingston. Macmillan & Co. 48 pp. Illust. A.3s. 3d.
A companion volume to *Heroes from Fiji* relating acts of courage and loyalty performed by Papuans and Europeans in the Territory.

Miscellaneous

**Solomon Islands Stories.* Prepared by Office of Information, British Solomon Islands. South Pacific Commission Literature Bureau. 32 pp. Illust. A.1s. 6d.
Four folk stories with a Solomon Islands background.

How the Crocodile Learnt to Bite. G. N. Lansdown. Macmillan & Co. 32 pp. Illust. A.2s. 0d.
Nine animal stories with a Pacific Islands background.

Plays for Young Pupils. C. Wedgwood. Longmans, Green & Co. 64 pp. A.2s. 6d.
Five plays specially written for use in Pacific Schools.

Na Dinau Sa Dau Vakavuna Na Leqa. Eunice Carpenter. Sheldon Press. 18 pp. A.10d.
A Fijian edition of *Debts Make Difficulties;* intended as a simple guide to the right use of money for people who are not completely accustomed to a cash economy.

**Na I Vosavosa Vakaviti E So.* Anare K. Raiwalui. Oxford University Press. 68 pp. A.4s. 0d.
A collection of 160 commonly-used Fijian idioms with literal English translations. Particularly useful for those learning Fijian, or any Fijian learning English.

Papua and New Guinea in Pictures. E. P. W. Marriott. Macmillan & Co. 96 pp. Illust. A.6s. 6d.
A photographically-illustrated social studies book suitable for use at fifth year level of English.

Stories from Papua. R. N. Gallyon. Macmillan & Co. 40 pp. Illust. A.2s. 2d.
Twelve folk and animal stories with an island background, retold in simple English.

**Peter and Seiva.* Wiriamu Aretoa. South Pacific Commission Literature Bureau. 72 pp. Illust. A.3s. 0d.
A true love story of the Pacific.

AGRICULTURE AND FISHERIES

**Wealth From The Coconut.* W. V. D. Pieris. South Pacific Commission Literature Bureau. 40 pp. Illust. A.3s. 2d.
A simple description of practical methods for the improvement of coconut plantations. Available in English, French, Fijian, Pidgin, Maori/Rarotongan, Samoan, Tongan, and Malayan languages.

**Rice.* W. Cottrell Dormer. Longmans, Green & Co. 16 pp. Illust. A.3s. 9d.
A simply written but practical account of rice growing intended mainly for Melanesian areas.

**How to Look After a Fishpond.* L. Devambez. South Pacific Commission Literature Bureau. 31 pp. A.1s. 0d.
Describes the construction, stocking, management and maintenance of a fishpond suitable for the raising of tilapia.
French version, *Votre Bassin de Pisciculture,* also available.

**How to Look After Fishnets.* L. Devambez. South Pacific Commission Literature Bureau. 15 pp. A.1s. 0d.
A companion volume to *How to Look After A Fishpond.* Details

the cleaning, drying, storing and method of preserving fishing nets.
French version, *L'Entretien de Filets de Pêche*, also available.

Fish Preservation Simplified. H. van Pel. South Pacific Commission Literature Bureau. 22 pp. Illust.
At present out of stock; will be reprinted if sufficient demand.

HEALTH AND HYGIENE

**A First Hygiene Book.* Sheila Jamieson. South Pacific Commission Literature Bureau. 32 pp. Illust. A.3s. 0d.
An illustrated first hygiene book for village schools written in very simple English.

**A Mothercraft Book.* N. Stead. South Pacific Commission Literature Bureau. 47 pp. Illust. A.1s. 0d.
An introduction to hygiene, mothercraft and simple nursing techniques for island girls with a reasonable education.

A Recipe Book for Pacific Islanders. Lucy Hamilton. Macmillan & Co. 160 pp. Illust. A.6s. 0d.
Contains much practical information on various cooking methods as well as over 500 tested recipes for the islands people.

**A Junior Health Reader.* E. P. W. Marriott. South Pacific Commission Literature Bureau. 80 pp. Illust. A.3s. 0d.
An elementary hygiene book, written at about Standard V level of English.

**Flies Are Your Enemy.* South Pacific Commission Literature Bureau. 32 pp. Illust. A1s. 0d.
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All the above are available from the South Pacific Commission Literature Bureau.

Literature Bureau Services. In addition to securing the production and publication of books, the Literature Bureau provides several other services for assisting the provision of literature in the territories. Briefly these are:

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Illustrated 1s 9d

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Peter Livingston

The stories in this book are true stories about some of the brave people of Papua and New Guinea. They are written in simple English and are illustrated with maps and line drawings by Elizabeth Halls. *Published in association with the South Pacific Commission Literature Bureau.* *2s 2d*

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This is the tenth in a series of short biographies intended mainly for the older pupils in Secondary Modern Schools. They give a lively and sympathetic account of a variety of people who, in their different ways, served mankind.

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MANUSCRIPT ADVISORY SERVICE: Territories quite often need to get certain reading materials produced for their own requirements, but do not have the necessary printing resources or personnel to handle them within the territory itself. Although in some cases this material may be of such localized application that it is outside the scope of the Bureau to produce it as a regional publication, nevertheless the Bureau is still able to examine the manuscript, to offer suggestions for its layout and production, and to obtain quotations from printers and publishers for producing it.

This information is then sent to the territory concerned, which is able either to follow it up on its own initiative or to ask the Bureau to handle the work on its behalf and at the territory's expense.

CUMULATIVE MANUSCRIPT REPORT: Each year the Bureau receives many manuscripts and suggestions from territories for new publications which are considered of potential use in the islands. It will be appreciated that it is not always possible to say with certainty what may be the final outcome of work on a particular manuscript or suggestion. The possibility of publication naturally depends on what sort of regional interest and demand there is in relation to cost of production; and of course regional interest pre-supposes that the various different territories are aware of what the others are doing, or proposing, in the literature field.

The Bureau prepares yearly a cumulative manuscript progress report which lists the manuscripts and suggestions for publication which have been received, and records the action being taken on them. This list is issued to all Research Council members and is available to territorial administrations for inspection on request. Enquiries concerning individual publications are always welcomed by the Bureau.

LIBRARY AND INFORMATION SERVICE: The Bureau maintains an extensive library of simple reading materials which have been prepared in many parts of the world for areas which experience literature provision problems somewhat similar to those in the Pacific. Information can be supplied appraising the simple books available on most subjects, and it is usually possible to arrange for inspection copies to be sent to education institutions and government departments.

Assistance is also provided in obtaining such books where difficulties are experienced in obtaining them in the islands.

ANCILLARY SERVICES: There are many different aspects of the literature provision problem, and the Bureau has information available about many of these, such as the stocking and running of small static libraries; the use of mobile libraries and book vans; the organization and stocking of small bookrooms and bookshops; the functioning of literature committees; and the organization of literary competitions.

It can also obtain advice about the types of printing equipment suitable for use in small establishments for the production of pamphlets and booklets. It should perhaps be mentioned here that, apart from mimeograph machines, equipment for printing is neither particularly cheap nor simple, and it is inadvisable for the inexperienced to embark on the establishment of printing plant without very careful prior investigation into costs and the requirements for satisfactory plant operation and maintenance. For that reason some may prefer to take advantage of the manuscript advisory service described above.

Lesson Notes For Agricultural Projects In New Guinea Schools. This book has been specially prepared by C. Brooks, Rural Education Officer in Rabaul. It deals with four well-known crops—peanuts, cowpeas, rice and sweet potatoes—and sets out a project covering the growing, storage and use of each.

The book is designed for the island teacher's use and between 18 and 25 lessons are devoted to each crop project. The notes not only include suggestions and directions for the essential practical work which is to be done in the school gardens, but also indicate ways in which class discussions and straightforward teaching can associate the children's work in these projects with their English, Arithmetic and other school work. It is of interest to note that each project is treated at a different level, i.e., the project for peanuts is dealt with at Standard 3 level, cowpeas at Standard 4, rice at Standard 5 and sweet potatoes at Standard 6.

Because of varying conditions and circumstances a comprehensive text book on school gardening having wide application is a very difficult thing to prepare. This particular book seemed to us to constitute an eminently practical and workmanlike approach. Jacaranda Press: A.9s. 6d.

Wealth From The Coconut. At the request of the Government of French Polynesia, the Literature Bureau has arranged for the printing of a Tahitian version of the already widely-known book, *Wealth From The Coconut*, by W. V. D. Pieris. This version will be produced in the same format as the other twelve editions which have so far been produced for the Pacific.

Visual Aids. We have been interested to see a leaflet describing a type of wall map which has a specially prepared plastic surface. The maps are in outline, and any special features can be drawn boldly on to them by the teacher as and when required, and wiped off again when finished with. It is easy to see the considerable advantages and opportunities this presents. Details may be obtained from Messrs. Philip & Tacey Ltd., 69-70 Fulham High Street, Fulham, London, S.W.6.

Mobile Library In New Caledonia

New Caledonia's Department of Fundamental Education has recently organized the operation of a mobile library in the form of a specially-equipped motor vehicle to bring books, brochures and educational films to the rural people of the island.

The library is fitted with shelves for the books and equipped with a motion picture sound projector and a tape recorder. It now carries out about fifteen tours a month, grouped round three or four centres.

The routine for each visit is that the arrival of the mobile library is heralded by music played over a loud speaker. Staff members then contact the village leaders to decide on the best place to operate in the evening when films are shown, accompanied by a running commentary so that they will be understood by all. At the end, a brief talk is given on the aims of the mobile library, and the distribution of books and pamphlets is announced for the next day.

The Golden Road to English Literature

W. J. BALL, M.A., and G. C. THORNLEY, M.A., PH.D.
This is a graded English literature course for secondary schools, consisting of four books of prose and poetry. Each piece is accompanied by brief notes on the author and his time, and exercises. The course introduces the student to the best in English literature and prepares him for general questions in the English Literature paper in the Cambridge Overseas School Certificate.

BOOK 1: *Ready May. Probably 4s.*

BOOK 2: *Ready late 1960. Probably 4s. 9d.*

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South-East Asia
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D. R. HUGHES, M.A.
The new edition of this book, which will be most useful for those revising for the Overseas School Certificate, has been brought up to date throughout and contains a new chapter on Ceylon. 7 maps and 21 diagrams. 2nd edition 1959. *3s. 6d.*

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An instructive text and amusing line illustrations make this an excellent background to geography study. 2nd edition 1958. *7s. 6d.*

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The Social Implications Of Nurse Training In Developing Communities

THIS is the title of a small pamphlet from the health section of the South Pacific Commission, produced by the Commission's Literature Bureau. The author is Dr. T. C. Lonie, former Public Health Officer, who suggests that the training of young island women in the profession of nursing enables them to exert a profound influence in the social development of their people. This is especially the case where the nurse is responsible for the immediate medical and nursing care of groups of persons, as in villages, where her specialized knowledge gives her a unique place in the life of the community. The circumstances of a long, disciplined training and the need to acquire a sense of personal duty and responsibility tend in the course of training to eliminate the more unstable and the less capable, and to the further development of character in those who stay the course.

Especially in the absence of other adequate medical service, the greater the gap between the knowledge of the nurse and the general level of education and knowledge in her community, the greater is her possible influence. Since the gap is always greatest in communities at an early stage of development, that influence may be very great, and the traditions of the nursing profession give some guarantee that it will be beneficent.

The booklet is particularly directed to those who by virtue of their position in guiding girls and young women upon the threshold of a career, may be able to direct their thoughts and inspirations to this most worthy calling of nursing.

Copies of this booklet are available on request from the Executive Officer for Health, South Pacific Commission, Nouméa, New Caledonia.

Storing Seeds To Maintain Viability

MAINTENANCE of viability of seeds during storage is sometimes a difficult problem in tropical countries. Some valuable practical advice on the subject is given in a very interesting monograph published in 1956 by the Commonwealth Agricultural Bureau in their *Bulletin* series, entitled *Storage of Seeds for Maintenance of Viability*. The author is Dr. Emilia Biasutti Owen. A chapter has been contributed by T. Ashton (*Bulletin 43* of the Commonwealth Bureau of Pastures and Field Crops, Hurley, Berks, England).

This publication contains the most complete information on effective seed storage, ranging from longevity of seeds to seed treatment for storing. In his conclusions the author states that "the two principal factors affecting the viability of seeds in storage are seed-moisture content and temperature". He also gives full information on the best ways of controlling these two factors.

From practical experience gained in the South Pacific—and this is in complete agreement with Dr. Biasutti Owen's conclusions—we can recommend the following means for keeping small quantities of valuable seeds in a good state of viability:

Place the seeds in clean, dry glass bottles or jars, well stoppered, and place with them a small quantity of "Silicagel". Keep the bottle in a cool place—a refrigerator, if possible. If the seeds are kept dry at a temperature between freezing point and 5°C. (41°F.), this is generally quite adequate for the preservation of their viability.—J.B.

Cheaper Housing In Papua And New Guinea

The Administration of Papua and New Guinea is carrying out experiments with various kinds of building materials in order to produce low-cost houses for the indigenous people.

Experiments with adobe blocks are being tried in the New Guinea Highlands, and with rammed earth in other districts.

Copra Industry In The Solomons

(Continued from page 55)

in isolated islands are to be encouraged to plant more coconuts, then better facilities for marketing must be provided.

The establishment, by the Copra Board, of a greater number of buying centres throughout the Protectorate, and the establishment of zones, each having separately-computed buying prices, legally controlled, may contribute much towards the advancement of the copra industry and the ultimate prosperity of the Protectorate.

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- *TECHNICAL PAPERS:* See list above.
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- *EXPERT REPORTS:* The Oxford University Press is publishing a series of Expert Reports in book form for the Commission. Four have been issued to date:

VOCATIONAL TRAINING IN THE SOUTH PACIFIC. By R. A. Derrick, M.B.E., A.M.I.S.E., F.R.G.S. Mr. Derrick's report consists of a survey of the facilities for professional and technical training in the whole of the South Pacific, and of recommendations for future development.
Price in Australia ..... *30/-A.*

MOTURIKI: A PILOT PROJECT IN COMMUNITY DEVELOPMENT. By Howard Hayden. A fully documented, copiously illustrated report on a pilot project in community development carried out under Commission sponsorship on the island of Moturiki by the Government of Fiji.
Price in Australia ..... *42/-A.*

SOCIAL ANTHROPOLOGY IN MELANESIA: A Review of Research by Dr. A. P. Elkin, Professor of Anthropology in the University of Sydney. In this report Dr. Elkin reviews past, present and future anthropological research in Melanesia, designed to advance native welfare.
Price in Australia ..... *27/6A.*

SOCIAL ANTHROPOLOGY IN POLYNESIA: A Review of Research by Dr. Felix M. Keesing, Professor of Anthropology, Stanford University. This is a parallel study to Professor Elkin's report on anthropological research in Melanesia.
Price in Australia ..... *27/6A.*

- *BIBLIOGRAPHY:* The following bibliography has been published for the Commission by Oxford University Press:

A BIBLIOGRAPHY OF BIBLIOGRAPHIES OF THE SOUTH PACIFIC: Compiled by Miss Ida Leeson, former Mitchell Librarian. A basic catalogue arranged by area and subject.
Price in Australia ..... *15/-A.*

- *OTHER PUBLICATIONS:*

The Construction of Literacy Primers for Adults: By Dr. K. Neijs ..... *5/-Stg.*
How to Make Your Own Filmstrips: By Nancy Phelan. *2/6Stg.*

The above volumes are obtainable through leading booksellers.

ENQUIRIES TO SOUTH PACIFIC COMMISSION, G.P.O. BOX 5254, SYDNEY, AUSTRALIA.

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